FINAL REPORT

EMPIRE MINE
RECLAMATION PROJECT

Lewis and Clark County, Montana

MDEQ/MWCB 470035

Prepared For:

Mr. Vic Andersen and Mr. Joel Chavez
Montana Department of Environmental Quality
Remediation Division
Mine Waste Cleanup Bureau
2209 Phoenix Avenue
P.O. Box 200901
Helena, Montana 59620

Prepared By:

Olympus Environmental Science and Engineering, Inc.
765 Colleen
Helena, Montana 59601

January 5, 1998

Olympus Work Order No. 97-7049-7

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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The Empire Mine Reclamation Project consisted of providing all labor, materials, earthwork, and incidentals necessary to excavate, haul and place mill tailings in an on-site unlined repository; reconstruct approximately 925 feet of floodplain though tailings piles #1 and #2; construct riprap-lined drop structures through the existing breached dams; grade and recontour waste rock piles; apply cover soil to the graded tailings, waste rock piles, and repository; organic amendment of cover soils; construct adit diversions; construct runon control ditches; revegetate disturbed areas; construct fences around the disturbed areas; and provide stormwater and erosion controls during construction.

1.2 LOCATION AND ACCESS

The mine and millsite are located adjacent to Empire Creek, a tributary to Lost Horse Creek which in turn flows into Little Prickly Pear Creek, in the Marysville District of the Helena National Forest. The site is accessed from Helena by taking Interstate 15 north to Lincoln Road (State Highway 279), then taking State Highway 279 north to Canyon Creek, then following County Route 707 along Little Prickly Pear Creek approximately 3 miles to County Route 709, then south along County Route 709 following Lost Horse Creek to Empire Creek. The mine and millsite are located approximately 1.3 miles up Empire Creek. The mine, millsite, tailings, and associated disturbances are located in Section 33 in Township 12 North, Range 6 West.

1.3 LAND OWNERSHIP

The Empire Mine is located on patented mining claims. The claims are owned by:

Steve Edwardson
1023 Eleventh Street
Thompson, ND 58278

1.4 HISTORY

The Empire Mine and associated claims are located in the Marysville Mining District. In 1886 the Empire Mine was purchased from Hickey and Cotter by the Empire Mining Company of London, England. Many of the investors also held stock in the Drumlummon mine. The company also purchased the adjacent Whipperwill Mine from Nate Vestal. At the time, the mine was little more than a prospect with several open cuts and shafts, the deepest of which was only down 70 feet. The ore was processed in a small 10-stamp mill in Combes Gulch. At the time of the purchase, the claim and mill had been idle for 10 years.

In 1886, the new company repaired the mill and began mining. The company made enough profit to authorize a new 60-stamp mill. In April of 1887, work began and 40 stamps were completed by November of the same year. The remaining 20 stamps were operational by the end of January 1888. In 1891, the mine was operated by the Golden Leaf Mining Company which employed 60 men at the mine. The mine continued to be profitably worked until 1893 when the price of silver plummeted. After 1893, the mine was worked intermittently by lessees and by a number of different owners. From 1887 to 1893, the mine was said to have produced $350,000 in ore.

In 1901, the mine was owned by the Gold Belt Mining Company. A cyanide plant was constructed and several hundred thousand tons of old tailings were reprocessed. The process was able to remove 90 percent of the remaining values from the tailings. The company also processed the dumps from the Jay Gould and Gloster mines in the nearby Stemple Gould Mining District.

The 60 stamps in the mill were removed from the property in 1928. Flotation mill equipment was installed in place of the stamps. This equipment was also removed from the mill, and there is no mention in the literature of the flotation equipment ever being used. By 1933, the property was in the hands of W.M. Manning of Helena, who once again began development work. The first recorded production by Manning occurred in 1934. The mine was worked from 1937 to 1943 with a peak of 14,065 tons of ore in 1939. After 1943, the mine was worked with small scale operations intermittently through 1988. Total recorded production was 36,087 tons of ore with a return of 5,684 ounces of gold; 19,666 ounces of silver; 85,839 pounds of copper; 1,248,168 pounds of lead; and from the late 1940's 36,462 pounds of zinc.

1.5 PROJECT OBJECTIVES

The primary objective of the Empire Mine Reclamation Project was to protect human health and the environment in accordance with the guidelines set forth by the NCP. Specifically, the remedy was selected to limit human and environmental exposure to the contaminants of concern and reduce the mobility of those contaminants in surface water and ground water resources.

2.0 RESPONSIBLE PARTIES

2.1 MDEQ/MWCB COORDINATION

The Montana Department of Environmental Quality/Mine Waste Cleanup Bureau (MDEQ/MWCB) Project Manager for the Empire Mine Reclamation Project was Joel Chavez. His address is:

Montana Department of Environmental Quality
Remediation Division
Mine Waste Cleanup Bureau
2209 Phoenix Avenue
Helena, Montana 59620
406-444-5440

2.2 RECLAMATION AND ENGINEERING PLAN

Olympus Environmental Science and Engineering, Inc. (Olympus) was assigned the responsibility of engineering and preparing the reclamation specifications prior to contractor selection. Curt Serviss was the Olympus Project Manager and Kevin Rauch, P.E, was the Engineer in responsible charge. The address of Olympus is:

Olympus Environmental Science and Engineering, Inc.
765 Colleen
Helena, Montana 59601
406-443-3087

2.3 QUALITY CONTROL INSPECTION

Olympus was responsible for construction engineering and quality control inspection. Kevin Rauch, P.E. performed the project engineering functions. Kevin Rauch and David Torgerson, P.E. were the primary construction inspectors.

2.4 CONTRACTOR

The successful low bidder for the project was Environmental Reclamation Northwest, LLC, (ERNW) of Butte, Montana. ERNW's address is:

Environmental Reclamation Northwest, LLC
P.O. Box 3809
Butte, MT 59702
406-782-0463

3.0 CHRONOLOGICAL LISTING OF EVENTS

3.1 PRE-BID CONFERENCE

The Empire Mine Reclamation Project Pre-Bid Conference was held on August 6, 1997, at 9:00 a.m. at the site. The conference was attended by representatives from MDEQ/MWCB, Olympus, and nine potential contractors. Meeting minutes and the attendance sign-in sheet for this conference are presented in Appendix A of this report.

3.2 BID DATE

The bid opening for the project was held on August 14, 1997, at 3:00 p.m. at the MDEQ/MWCB office at 2209 Phoenix Avenue in Helena, Montana.

3.3 LOWEST BIDS

Nine (9) qualified bidders responded with bids ranging from $217,168 to $674,790, with an average of $333,471.14. The Engineer's estimate was $300,729. The bid tabulations are presented in Appendix B. The bids are summarized in Table 1.

3.4 CONTRACT AWARD

The contract was awarded to ERNW, LLC, who was the low bidder. The prime contractor's address is shown under Section 2.1. Two subcontractors were used for the project. Rich-Mark Corp. (R-M) of Lincoln, Montana, was the primary subcontractor and completed all of the on-site work except the fencing.

Harlan Denboer (HD) of Lincoln, Montana was subcontracted by ERNW to construct the fences. R-M provided additional labor support for the fence construction. The Notice of Award is included in Appendix C.

3.5 CONTRACT AGREEMENT

The Contract Agreement was signed on August 18, 1997. The Notice to Proceed was issued for a start-up date no later than September 8, 1997. The contractor was to complete the specified work within ninety (60) consecutive calendar days for an anticipated completion date of November 6, 1997. The Notice to Proceed is included in Appendix C.

3.6 CONSTRUCTION START-UP

The Pre-Construction Meeting was held on September 4, 1997, at 12:00 p.m. at the MDEQ/MWCB office. Joel Chavez (MDEQ/MWCB) and Kevin Rauch (Olympus) lead the meeting. Additional attendees included Rusty Sheppard and Kris Paffhausen of ERNW.

The general scope of work was discussed to make sure that all parties had the same understanding of the project. Submittals, including the construction schedule and traffic control plan, were discussed. ERNW indicated that they planned on completing the project in 21 working days, which included four bad weather days. Also discussed was the replacement of a county road bridge that would affect access to the site. The bridge was scheduled to be completed by September 12, 1997. ERNW asked permission to wait to mobilize until after the bridge on the premise that proposed 21 day schedule would allow completion of the project before winter weather typically sets in.

Another issue addressed at the pre-construction meeting was the temporary diversion. It was stressed to the contractor that it was important to get the diversion installed as soon as possible so that the tailings, which had previously been shown to be saturated in some areas, could have a chance to drain. The diversion pipe was also addressed. The contractor's bid price for that item was low enough that it would not support purchasing the specified pipe. ERNW indicated that they already owned enough pipe to complete the diversion.

TABLE 1. BID SUMMARY.

Bid Item	ERNW, LLC	M.K. Weeden Construction	MC-3 Construction	Baxter Construction	DEBCON, Inc.	High Mountain Construction	Concrete Septic Tank Company	Montgomery Construction	AJAX Contracting, Inc.
Mob, Bonding, Insurance	8,500.00	23,088.00	11,747.00	41,500.00	30,000.00	50,000.00	41,368.00	52,400.00	81,000.00
Road Improvements									
On-Site Road Improvements	8,400.00	2,520.00	4,200.00	8,400.00	2,100.00	6,300.00	4,368.00	4,200.00	29,400.00
Apply Dust Control	300.00	2,500.00	5,000.00	2,500.00	3,000.00	5,000.00	2,000.00	2,000.00	1,250.00
Tailings Pile Runon Control Ditch	2,100.00	2,100.00	7,000.00	1,400.00	2,800.00	2,450.00	6,552.00	14,000.00	21,000.00
Temporary Stream Diversion	5,300.00	28,700.00	3,000.00	25,000.00	20,000.00	22,800.00	33,440.00	26,000.00	15,000.00
Clearing and Grubbing	1,100.00	2,800.00	3,000.00	2,500.00	10,000.00	6,000.00	5,836.00	10,000.00	10,000.00
Demolish/Dispose Concrete Found	3,200.00	3,500.00	3,000.00	3,500.00	2,000.00	5,000.00	5,015.00	8,000.00	10,000.00
Wood and Metal Debris Removal	2,500.00	5,660.00	5,000.00	12,000.00	5,000.00	16,000.00	16,145.00	10,000.00	15,000.00
Repository Excavation	8,700.00	2,465.00	8,700.00	4,350.00	2,900.00	4,350.00	5,365.00	10,005.00	11,600.00
Organic Amendment	3,600.00	15,000.00	18,000.00	11,100.00	12,000.00	26,400.00	3,480.00	21,720.00	18,000.00
Prepare Repository Subgrade	4,170.00	2,085.00	4,170.00	2,085.00	4,170.00	5,629.50	3,461.10	2,502.00	4,170.00
Floodplain Excavation and Grading									
Exc Tails, Haul, Place in Repos	21,545.00	31,275.00	48,650.00	45,175.00	41,700.00	45,175.00	82,705.00	55,600.00	104,250.00
Floodplain Grading	1,650.00	1,500.00	1,500.00	1,500.00	7,500.00	1,080.00	9,735.00	22,500.00	7,500.00
Construct Repository Cap	11,656.00	5,264.00	7,520.00	5,640.00	5,640.00	18,800.00	11,167.20	11,280.00	50,760.00
Backfill/Grade Tailings Excavation	11,749.00	17,055.00	7,580.00	17,055.00	22,740.00	41,690.00	26,530.00	18,950.00	75,800.00
Construct Drop Structures									
Filter Fabric	528.00	792.00	440.00	660.00	880.00	1,980.00	792.00	1,320.00	1,320.00
Gravel Cushion	2,080.00	1,200.00	2,400.00	1,920.00	2,400.00	2,080.00	476.00	3,200.00	6,000.00
Riprap	7,600.00	7,600.00	11,400.00	7,600.00	15,200.00	6,080.00	9,234.00	11,400.00	22,800.00
Waste Rock Grading	4,960.00	4,464.00	9,920.00	9,920.00	14,880.00	8,928.00	12,400.00	12,400.00	39,680.00
Cover Soil Application To WR Piles	16,560.00	10,350.00	31,050.00	24,322.50	14,490.00	25,875.00	19,520.10	10,350.00	36,225.00
Repository/WR Runon Ditches	5,490.00	2,745.00	5,490.00	1,830.00	3,660.00	3,477.00	2,379.00	5,490.00	9,150.00
Fertilizing and Seeding	14,500.00	6,960.00	4,060.00	4,640.00	11,600.00	6,960.00	4,106.40	11,600.00	14,500.00
Mulch	2,000.00	2,400.00	1,200.00	4,000.00	4,000.00	7,200.00	8,532.00	4,000.00	16,000.00
Install Erosion Control Mat	6,930.00	13,860.00	6,930.00	19,750.50	13,860.00	2,079.00	13,167.00	20,790.00	17,325.00
Construct Fences									
4-Strand Barbed-Wire Fence	44,100.00	12,600.00	9,450.00	22,050.00	25,200.00	17,640.00	10,080.00	18,900.00	18,900.00
Cattle/Hog Panel Fence	8,600.00	5,848.00	2,580.00	3,870.00	8,600.00	5,160.00	4,902.00	3,440.00	3,010.00
Reclaim Temporary Roadways	4,200.00	2,800.00	2,800.00	1,820.00	1,400.00	2,660.00	2,520.00	2,520.00	28,000.00
Obtain MPDES Stormwater Permit									
Discharge Permit	650.00	650.00	650.00	650.00	650.00	650.00	650.00	650.00	650.00
Straw Bales	1,000.00	900.00	2,000.00	1,200.00	500.00	1,000.00	650.00	1,000.00	1,500.00
Silt Fence	3,500.00	2,250.00	2,000.00	1,750.00	2,000.00	3,500.00	620.00	2,000.00	5,000.00
	217,168.00	220,931.00	230,437.00	289,688.00	290,870.00	351,943.50	347,195.80	378,217.00	674,790.00

3.7 CHANGE ORDERS

One change order was written for this project. A copy of the change order is presented in Appendix D of this report. Change Order No. 1 decreased the contract amount by $12,589.00 with no change in the contract date. The purpose of Change Order No. 1 was to adjust for minor changes in actual quantity bid items (road improvement, dust control, tailings pile runon control ditch, organic amendment, repository and waste rock piles runon control ditches, erosion control mat, 4-strand barbed-wire fence, cattle/hog panel fence, reclaim temporary roadways, straw bales, and silt fence).

3.8 WORK STOPPAGES

No work stoppages occurred on this project.

3.9 REQUESTS FOR PAYMENT

Two (2) payment requests were made during this project. Payment Request No. 1 was for the period of September 9 to October 30, 1997, and the amount earned, less taxes and retainage was $145,414.76.

Payment Request No. 2 was for the period of November 1 to November 5, 1997. The amount earned, less taxes and previous payments, was $57,118.45. Copies of the Payment Request forms are presented in Appendix E of this report.

3.10 SUBSTANTIAL COMPLETION

The date of Substantial Completion was November 5, 1997.

3.11 FINAL COMPLETION AND APPROVAL

A final field inspection was conducted by Kevin Rauch of Olympus and Joel Chavez of MDEQ/MWCB on November 5, 1997. The final completion date is one year from the Substantial completion date or November 5, 1998. Copies of the Affidavit on Behalf of the Contractor, the Contractor's Certificate of Completion, the Consent of Surety to Final Payment, the Certificate of Substantial Completion, and the Certificate of Acceptance are presented in Appendix F.

3.12 FINAL PAYMENT

The final payment of $57,118.45 was approved by MDEQ/MWCB on January 5, 1997. A copy of the final payment request form (Payment Request No. 2) is included in Appendix E.

4.0 CONSTRUCTION

4.1 DESCRIPTION OF THE PROJECT PLAN

The work consisted of providing all labor, materials, earthwork, and incidentals necessary to improve existing access roads; construct short access roads; clear and grub; install a temporary stream diversion; demolish and bury concrete foundations; remove wood and metal debris; excavate and stockpile repository subgrade; excavate, haul and place mill tailings in an on-site unlined repository; handle wet tailings; reconstruct approximately 925 feet of floodplain though tailings piles #1 and #2; construct riprap-lined drop structures through the existing breached dams; grade and recontour waste rock piles; organic amendment of cover soils; apply cover soil to the graded tailings, waste rock piles, and repository; construct adit drainage diversions; construct runon control ditches; revegetate disturbed areas, including fertilizing, seeding and mulching; construct 4-strand barbed-wire fence around the perimeter of revegetated areas and a woven wire fence around the perimeter of the repository; and provide stormwater and erosion controls during construction.

The purpose of this reclamation project was to limit human and environmental exposure to the contaminants-of-concern and reduce the mobility of these contaminants to mitigate impacts to the surface water resources. The reclamation plan involved removing those waste sources at the Empire Mine which are the principal sources of concern (the tailings in the floodplain and the vat area) and disposing of these wastes in a constructed, unlined repository. The repository was constructed approximately 1300 feet southeast of the historic Empire mill site. The total surface area of the repository is approximately 0.86 acres, while the total surface area of the two tailings piles is approximately 1.5 acres. Some of the existing roads were improved to allow access to the mine wastes. Two small waste rock piles, 0.5 acres and 0.75 acres, were graded out to approximately match the surrounding topography. Two foundations in the repository area were demolished and buried in waste rock pile WR-1. Approximately 0.75 acres of timber and slash were removed from the repository, borrow area, and tailings piles to accommodate construction activities.

Tailings were excavated from the floodplain to provide a minimum floodplain width of 40 feet, but the stream channel was left undisturbed. The excavated tailings areas were backfilled with 1.5 feet of cover soil from on-site borrow sources. The upper 0.5 feet of cover soil was amended with organic compost. Coconut-fiber erosion control mat was placed on the backfilled floodplain areas after seeding and fertilizing. Riprap-lined drop structures were constructed through breaches in the existing dams to provide long-term stability and protection of the tailings during flood events. Disturbed areas were revegetated with a reclamation seed mix, fertilized, and mulched with certified weed-free straw and crimped by bulldozer tracking.

Ditches were constructed to divert surface water runon away from the reclaimed areas. Fences were constructed around the reclaimed areas to allow for the establishment of vegetation without the interference from livestock. A woven-wire fence was constructed around the repository. Portions of the roads constructed or improved at the site were reclaimed immediately after the reclamation activities were completed; however the main county road through the site was left intact and areas significantly impacted by construction activities were repaired. Metal debris was removed from the site and disposed of at the Lewis and Clark County Landfill. Wood debris was piled and burned on site.

4.2 MAJOR EQUIPMENT LIST

The major equipment used on the Empire Mine Reclamation Project is listed in Table 2.

TABLE 2. MAJOR EQUIPMENT LIST.

TYPE	MAKE/MODEL	HORSEPOWER	CAPACITY
Excavator with thumb	Komatsu PC200	135	1.25 CY
Excavator with thumb	Komatsu PC220	170	2.25 CY
Bulldozer	Komatsu D65EX	200	
Front-end wheel loader	Komatsu WA 250		3 CY
Articulating haul truck	Trojan O&K 24.5		22
Articulating haul truck	Trojan O&K 24.5		22
Articulating haul truck	Trojan O&K 24.5		22
Motor grader	Caterpillar 12 f	90	
Dump truck	Ford LT 9000		12 CY

4.3 CONTRACTOR EMPLOYEES

No prime contractor employees worked on site during the project. A total of 14 different subcontractor employees worked on the Empire Mine Reclamation Project. These employees included 12 employees of R-M, and two employees of HD as the fence subcontractor. Mark Mercill, President of R-M was the primary project contact and Aaron Hagen of R-M was the project foreman. The typical daily crew consisted of one excavator operator, one bulldozer operator and two or three dump truck drivers. Additional equipment operators and laborers were used as needed.

4.4 CONSTRUCTION ACTIVITIES

Contractor mobilization and road improvements began on September 9, 1997. Major construction activities began on September 17, 1997. A summary of daily activities are as follows:

September 9, 1997 – The primary subcontractor, Rich-Mark Corp. mobilized a motor grader to the site and started working on road improvements. Kevin Rauch and David Torgerson of Olympus met on site with Rusty Sheppard of ERNW and Mark Mercill of Rick-Mark Corp. A brief tour of the floodplain, repository, and diversion pipe areas was completed. Installation of the diversion was identified as top priority to allow the tailings to drain before excavation. The tailings removal was discussed and ERNW indicated that they planned to start downstream in the vat area and work upstream. Olympus stressed that excavation in the floodplain area should leave as much of the existing stream channel as possible undisturbed. ERNW indicated that there would not be much activity for the remainder of the week because they did not plan to fully mobilize until after the new county road bridge across Little Prickly Pear Creek was completed.

September 15, 1997 – Kevin Rauch (Olympus) and Joel Chavez (MDEQ/MWCB) met on site with the land owner, Steve Edwardson. A tour was conducted to show Mr. Edwardson the extent of the project plan for tailings removal, floodplain reconstruction, waste rock grading, and repository construction. Mr. Edwardson endorsed the plan as presented. Debris removal was discussed. Mr. Edwardson indicated that he was not interested in keeping any of the wood or metal debris. It was indicated to Mr. Edwardson that the only debris that would be removed as part of the project was the metal debris in the mill area and other wood and metal debris that was in the construction area. Other debris would be his responsibility. Mr. Edwardson indicated that he would like to have ERNW remove all of the debris and buildings at the site. Joel Chavez indicated that this would be between him and ERNW and could not involve the state or interfere with the completion of the contract.

September 16, 1997 – A Komatsu D65EX bulldozer was delivered to the site by R-M

September 17, 1997 – R-M removed the two concrete foundations from the repository and began felling trees and clearing and grubbing the repository area. Olympus inquired if R-M or ERNW had requested a utility locate for the site. There are two telephone pedestals in the vicinity of the repository, which indicates that there are buried telephone lines in the area. R-M was holding off on excavation work until a utility locate was completed. A truck load of 12-inch diameter HDPE pipe arrived at the site. R-M had no knowledge of the pipe order so Olympus called ERNW. The pipe specified for the diversion was 24-inch HDPE pipe. Pat Walters of ERNW indicated he had been instructed to order 12-inch HDPE pipe.

September 18, 1997 – Olympus tried to contact ERNW to resolve the problem with the diversion pipe, but was unsuccessful. Mark Mercill of R-M had contacted ERNW who indicated that 18-inch and 24-inch pipe would both require 3 or 4 weeks delivery time so ERNW ordered 12-inch pipe. Olympus expressed concern that the 12-inch pipe would not pass the 2-year design discharge of 12 cubic feet per second (cfs). Because the larger pipe was not available and the project could not wait 3 or 4 weeks for delivery, a compromise was reached. R-M agreed to construct the diversion ditch and line it with plastic sheeting prior to placing the pipe in the ditch. In the event that the pipe overflowed, the plastic-lined ditch could convey the overflow. A Komatsu PC 200 excavator was delivered to the site. R-M began collecting and stockpiling wood and metal debris with the excavator. The first load of organic compost was delivered to the site by Eko Compost of Missoula, Montana. Clearing and grubbing continued in the repository area.

September 19, 1997 – The second and third organic compost loads were delivered by Eko Compost. The R-M crew cleared wood and metal debris with the excavator and stripped and stockpiled topsoil from the repository area. Roscoe Steel delivered two rolls of geotextile filter fabric for the drop structures and 17 rolls of erosion control mat. R-M started on the diversion/tailings pile runon control ditch.

September 22, 1997 – R-M crew continued work on the diversion/tailings pile runon control ditch. Alan Stine (Olympus), a licensed monitoring well decommissioner, abandoned monitoring well MW-3, which was located in tailings pile TP-2 near the dam. R-M provided equipment to pull the well casing. A One-Call utility locator arrived on site and located the telephone line. The line comes in from Mt Belmont and follows the county road from the repository all the way through the site. The fourth and fifth organic compost loads were delivered by Eko Compost.

September 23, 1997 – The diversion/tailings pile runon control ditch was completed, seeded, fertilized, and lined with erosion control mat. The R-M crew placed plastic in the ditch and started laying the diversion pipe. A Trojan six-wheel, articulating dump truck was delivered to the site. Roscoe Steel delivered 88 more rolls of erosion control mat. The sixth and seventh organic compost loads were delivered by Eko Compost

September 24, 1997 – R-M continued placing diversion pipe in the diversion ditch. They had difficulty with pipe joints coming loose on bends. Olympus approved driving metal fence posts into the lined ditch to hold the pipe in place on bends. The excavator broke down and needed parts that would not be available until September 26. R-M continued stripping and stockpiling topsoil and subsoil from the repository. The eighth and ninth organic compost loads were delivered by Eko Compost

September 25, 1997 – Fence posts were driven into the diversion ditch to hold the pipe in place on bends and the remaining pipe was installed. Empire Creek was dammed with an earthen berm to divert the stream into the diversion pipe. The diversion pipe ended near the TP-2 dam and the water flowed down an old drainage channel below Adit No. 5. The adit channel is lined with large diameter rock and runs between TP-2 and the vat area. Olympus monitored the diversion outlet for excessive erosion. No significant sedimentation was observed. R-M continued stripping and stockpiling topsoil and subsoil from the repository. An estimated 1,800 cubic yards was stripped and stockpiled. The tenth and eleventh organic compost loads were delivered by Eko Compost

September 26, 1997 – Mechanics were working to repair the excavator. R-M continued stripping and stockpiling topsoil and subsoil from the repository. Olympus checked the diversion pipe outfall for signs of erosion and none were observed.

September 29, 1997 – R-M worked on building a haul road through the tailings to the vat area. The repository subgrade was compacted with a loaded haul truck.

September 30, 1997 – R-M continued working on the haul road through the tailings and had problems with soft spots. They layed filter fabric in the soft spots and covered it with soil to stabilize the road. A second Trojan articulating haul truck was delivered to the site. Concrete debris from the demolished foundations was loaded and hauled to waste rock pile WR-1, where it was placed and covered with waste rock. Olympus completed moisture and density tests on the repository subgrade. One area failed compaction specifications. Olympus asked R-M to recompact the failed area.

October 1, 1997 – R-M recompacted the repository, cleared wood and metal debris from WR-1 and WR-2, and continued grading waste rock.

October 2, 1997 – R-M continued removing debris from WR-2 and hauled and decked trees by the repository. Grading continued on WR-1.

October 3, 1997 – Grading was nearly completed on WR-1, and grading continued on WR-2. R-M started constructing the adit drainage channel around WR-1. R-M was mixing compost into stockpiled soil for the repository cap.

October 6, 1997 – A Komatsu WA 250 front-end wheel loader was delivered to the site. Cover soil was excavated from the borrow area east of the mill and hauled to WR-1 with two haul trucks. Grading of WR-2 was finished.

October 7, 1997 – R-M started mixing compost with cover soil in the borrow area by the mill. The weather was rainy so Olympus instructed R-M to put up silt fence where the waste rock haul road crosses Empire Creek and around the repository. The R-M crew hauled cover soil to WR-2. The road to the waste rock piles was becoming wet so R-M switched to hauling compost amended soil to WR-1 so that it could be completed before the road became too muddy. When leaving the site at the end of the day, Olympus observed that Lost Horse Creek had high turbidity but Empire Creek, which drains into Lost Horse Creek, was running clear. A logging operation on Lost Horse Creek was the suspected source of sediment.

October 8, 1997 – Approximately two inches of snow fell overnight. R-M finished hauling compost amended soil to WR-1 and completed the adit drainage channel around the lower side of WR-1. R-M resumed hauling unamended cover soil to WR-2. A third Trojan articulating haul truck was delivered to the site. The front-end loader and one haul truck each had flat tires. Joel Chavez, Jack Yates, and Tom Mostad of MDEQ/MWCB came to observe site activities. Olympus and MDEQ discussed concerns about the recent rain and snow and the impact on the project. The weather forecasts indicated more snow was coming. It was decided to hold off on excavating tailings from the floodplain until the weather turned better.

October 9, 1997 – R-M finished hauling cover soil to WR-2 and placed erosion control mat on the steep lower face of WR-1. They continued work on the tailings haul road in preparation for excavation of vat area tailings.

October 10, 1997 – R-M started hauling tailings from the vat area to the repository. The haul road became soft and rutted as the ground thawed. R-M hauled rock from a pile west of the mill and placed it in the rutted areas. The roads were still a problem so the crew moved from the vat area to start constructing the runon ditch around the repository. The runon ditch was excavated, seeded, fertilized, and lined with erosion mat. Olympus instructed R-M to place straw bales across the floodplain in the area below where the haul road crossed the floodplain.

October 11, 1997 – R-M purchased straw bales, placed them in the floodplain as instructed, and continued excavating and hauling tailings from the vat area.

October 14, 1997 – R-M continued excavating and hauling tailings from the vat area. The progress was slow because of the one-way haul road and narrow access to the vat area. Cover soil was back-hauled to the vat area by the haul trucks. The vat area was backfilled and graded as the excavation continued so that the haul road could be reclaimed as the work progressed upstream. Olympus started staking the floodplain excavation.

October 15, 1997 – The vat area excavation was completed and the last of the cover soil was placed and graded. R-M started excavating tailings from the floodplain on the south side Empire Creek. Olympus finished staking the floodplain excavation. A second excavator (Komatsu PC 220) was delivered to the site.

October 16, 1997 – R-M excavated tailings from the floodplain with two excavators and hauled tailings to the repository. Cover soil was back-hauled to backfill excavated areas. Olympus conducted periodic inspections of erosion control best management practices (BMPs) and observed downstream streamflow conditions.

October 17-19, 1997 – R-M continued excavating tailings from floodplain and backfilling excavated areas. Backfilled areas were seeded, fertilized, and erosion mat was installed. The bulldozer was used to grade the repository into lifts. Certified weed-free straw mulch was spread on waste rock pile WR-1.

October 20, 1997 – Tailings pile TP-2 was completed; however, one area on the north side of the tailings dam required additional work to achieve the proper floodplain width. Most of TP-1 was excavated, except for the area where the haul road crosses the floodplain. Cover soil was being hauled and placed in the floodplain. Cover soil was seeded, fertilized, and erosion mat was placed. The wet tailings were making the repository difficult to grade.

October 21, 1997 – R-M cleared trees from the riprap borrow source and stockpiled riprap. A new borrow source below WR-2 was developed and soil was stockpiled. Work continued on grading, seeding, fertilizing, and placing erosion mat in the floodplain. The remaining straw was spread on WR-2.

October 22, 1997 – R-M spread cover soil over tailings outside of the floodplain excavation. Riprap was hauled from the borrow area and stockpiled on TP-1 and TP-2 for the drop structures. The TP-2 dam was prepared for drop structure construction by removing wood debris and tailings. R-M started blending dry cover soil with wet tailings in the repository to control the moisture content. Moisture/density tests showed favorable results.

October 23, 1997 – Additional cover soil was hauled to the repository to replace soil used to mix with tailings. R-M brought in additional laborers to seed, fertilize, and mulch tailings outside of the floodplain. The TP-2 drop structure was completed. The fencing subcontractor arrived on site and started fencing WR-1. A haul truck was demobilized.

October 24, 1997 – R-M finished spreading cover soil on TP-2 outside of the floodplain excavation, and the area was seeded, fertilized and mulched. The fencing on WR-1 was completed and the fence around WR-2 was started. Laborers were working on seeding, fertilizing, and mulching the main borrow area by the mill. The TP-1 drop structure was completed. The Komatsu PC 220 excavator was demobilized.

October 25-26, 1997 – R-M worked on grading the repository and blending in dry cover soil to reduce the moisture content. Cover soil was spread over the east half of the repository. The fence subcontractor completed the fence around the mill borrow area and started the repository fence. One haul truck was demobilized.

October 28, 1997 – The remaining cover soil was hauled and placed on the repository. The final grading of the repository was completed. The steepest slope is approximately 7:1 (the design slope) and the slope of the main repository surface is 5 to 7 percent. Work continued on the repository fence.

October 29, 1997 – The last of the erosion mat was installed on the floodplain and Empire Creek was diverted back into its channel through the tailings piles. The tailings outside of the floodplain on TP-1 were seeded, fertilized, and mulched. Work continued on the repository fence. The last haul truck was demobilized from the site.

October 30, 1997 – The borrow area below WR-2 was seeded, fertilized, and mulched. R-M started seeding, fertilizing, and mulching the repository. Logs decked by the repository were loaded and hauled off site. The motor grader was delivered to the site to repair and reclaim haul roads. The front-end wheel loader was demobilized.

October 31 to November 4, 1997 – The repository fence and the fence around the tailings piles and vat area were completed. The road to the waste rock piles was reclaimed and seeded. Metal debris was hauled from the site to the Lewis and Clark County landfill. The bulldozer was demobilized on November 3.

November 5, 1997 – The final inspection was completed by Joel Chavez (MWCB) and Kevin Rauch (Olympus). The work was deemed substantially complete; however, several minor items were identified that required completion: one or two loads of metal debris needed to be hauled off site; the drop structure at TP-2 required hand placement of a few more rocks to cover thin areas; soil needed to be pulled back away from the culvert at the junction of the county road; and the road to the waste rock piles and a muddy spot on the county road at the lower end of the site needed repair. Most of these items were already on R-M's agenda for the following day.

November 6, 1997 – R-M completed the final tasks and demobilized the excavator and motor grader.

4.5 QUANTITIES USED

Work items were bid on lump sum, design quantity, and unit price bases. Table 3 provides lists of each item, the unit of measurement, and the estimated versus actual quantity. Design quantities were generally field-verified as being within the contract range. Verification methods included surveying and load counts. No disputes were formally raised by the contractor.

5.0 PROJECT COSTS

5.1 PAY REQUESTS

Two pay requests were processed for this project as discussed in Section 3.9. Copies of the pay requests are included in Appendix E.

TABLE 3. QUANTITIES SUMMARY.

ITEM NO.	ESTIMATED QUANTITY	ACTUAL QUANTITY	UNIT	DESCRIPTION
1	1	1	Lump Sum	Mobilization, Bonding, Insurance
2				Road Improvements
	4,200	5,750	Lineal Feet	On-Site Road Improvements
	100	0	1,000 gallons	Apply Dust Control
3	1,400	1,040	Lineal Feet	Tailings Pile Runon Control Ditch
4	1	1	Lump Sum	Temporary Stream Diversion
5	1	1	Lump Sum	Clearing and Grubbing
6	1	1	Lump Sum	Demolish and Dispose of Concrete Foundations
7	1	1	Lump Sum	Wood and Metal Debris Removal
8	2,900	2,900	Cubic Yards (D.Q.)	Repository Excavation
9	120	111	Dry Tons-Equiv.	Organic Amendment
10	4,170	4,170	Square Yards	Prepare Repository Subgrade
11				Floodplain Excavation and Grading
	6,950	6,950	Cubic Yards (D.Q.)	Excavate Tailings, Haul, Place in Repository
	1.5	1.5	Acres	Floodplain Grading
12	3,760	3,760	Cubic Yards (D.Q.)	Construct Repository Cap
13	3,790	3,790	Cubic Yards (D.Q.)	Backfill and Grade Tailings Excavations
14				Construct Drop Structures
	440	440	Square Yards	Filter Fabric
	80	80	Cubic Yards (D.Q.)	Gravel Cushion
	380	380	Cubic Yards (D.Q.)	Riprap
15	4,960	4,960	Cubic Yards (D.Q.)	Waste Rock Grading
16	2,070	2,070	Cubic Yards (D.Q.)	Cover Soil Application To Waste Rock Piles
17	1,830	1,225	Lineal Feet	Repository and Waste Rock Runon Ditches
18	5.8	5.8	Acres (D.Q.)	Fertilizing and Seeding
19	4.0	4.0	Acres	Mulch
20	6,930	5,525	Square Yards	Install Erosion Control Mat
21				Construct Fences
	6,300	4,368	Lineal Feet	4-Strand Barbed-Wire Fence
	860	960	Lineal Feet	Cattle/Hog Panel Fence
22	2,800	3,000	Lineal Feet	Reclaim Temporary Roadways
23				Obtain MPDES Stormwater Permit
	1	1	Lump Sum	Discharge Permit
	100	12	Each	Straw Bales
	1,000	1,500	Lineal Feet	Silt Fence

Note D.Q.=Design Quantity

5.2 TOTAL PROJECT COSTS

The total construction cost for this project was $204,579.00. ERNW was awarded the contract and received $204,579.00. The original bid was $217,168.00, with one change order issued for ($12,589.00) as described in Section 3.7. Table 4 presents cost breakdown and the percent of the construction cost for each bid item. As shown in Table 4, the major cost items were the barbed-wire fence (14.95%); tailings excavation, hauling and placement in the repository (10.53%); cover soil application to the waste rock piles (8.09%); and fertilizing and seeding (7.09%), which accounted for 40 percent of the total construction cost.

The total engineering cost for this project was $156,415.86. These costs are presented in Table 5. An analysis of the engineering costs versus the construction costs is presented in Appendix G. The total project cost was $360,994.86.

Table 4. Total Construction Cost Summary.

ITEM NO.	DESCRIPTION	TOTAL QUANTITY	UNITS	TOTAL COST	PERCENT OF TOTAL
1	Mob, Bonding, Insurance	1	LS	8500	4.15%
2	Road Improvements				
2	On-Site Road Improvements	5750	LF	11500	5.62%
2	Apply Dust Control	0	1,000 GAL	0	0.00%
3	Tailings Pile Runon Control Ditch	1040	LF	1560	0.76%
4	Temporary Stream Diversion	1	LS	5300	2.59%
5	Clearing and Grubbing	1	LS	1100	0.54%
6	Demolish and Dispose of Concrete Foundation	1	LS	3200	1.56%
7	Wood and Metal Debris Removal	1	LS	2500	1.22%
8	Repository Excavation	2900	CY	8700	4.25%
9	Organic Amendment	111	Dry Ton	3330	1.63%
10	Prepare Repository Subgrade	4170	SY	4170	2.04%
11	Floodplain Excavation and Grading				
11	Excavate Tailings, Haul, Place in Repository	6950	CY	21545	10.53%
11	Floodplain Grading	1.5	Acre	1650	0.81%
12	Construct Repository Cap	3760	CY	11656	5.70%
13	Backfill/Grade Tailings Excavation	3790	CY	11749	5.74%
14	Construct Drop Structures				
14	Filter Fabric	440	SY	528	0.26%
14	Gravel Cushion	80	CY	2080	1.02%
14	Riprap	380	CY	7600	3.71%
15	Waste Rock Grading	4960	CY	4960	2.42%
16	Cover Soil Application . To Waste Rock Piles	2070	CY	16560	8.09%
17	Repository/Waste Rock Runon Control Ditches	1225	LF	3675	1.80%
18	Fertilizing and Seeding	5.8	Acre	14500	7.09%
19	Mulch	4	Acre	2000	0.98%
20	Install Erosion Control Mat	5520	SY	5520	2.70%
21	Construct Fences				
21	4-Strand Barbed-Wire Fence	4368	LF	30576	14.95%
21	Cattle/Hog Panel Fence	960	LF	9600	4.69%
22	Reclaim Temporary Roadways	3000	LF	4500	2.20%
23	Obtain MPDES Stormwater Permit				
23	Discharge Permit	1	LS	650	0.32%
23	Straw Bales	12	EA	120	0.06%
23	Silt Fence	1500	LF	5250	2.57%
			Total	204579	100.00%

TABLE 5. SUMMARY OF ENGINEERING COSTS.

ENGINEERING SERVICE	AMOUNT
Reclamation Work Plan, Field Sampling Plan, and Supporting Documentation, Site Characterization, and Engineering Evaluation/Cost Analysis (completed by MSE-HKM, Inc.)	$86,454.00
Engineering Design and Bid Specification Preparation	$34,124.71
Construction Engineering	35,837.15
TOTAL	**$156,415.86**

6.0 PROJECT SUMMARY

6.1 SUMMARY OF THE PROJECT

The project went as scheduled with few modifications. The only significant change was the excavation of less tailings than anticipated. After Empire Creek was diverted, it was discovered that there were several springs in the floodplain that contributed a significant portion (nearly half by visual observation) of the flow in Empire Creek. Since there was no feasible way to collect and divert the spring water, the floodplain adjacent to the stream channel remained wet and marshy. Therefore, tailings in marshy areas adjacent to the stream channel that were well vegetated were left in place to prevent the release of tailings into the stream during excavation. Although additional tailings were left in place, these areas are well vegetated and along with the widening of the floodplain should keep the tailings stabilized and protected from erosion.

As expected, the excavated tailings were very wet and a high percentage of the tailings were saturated. This caused problems with compacting tailings in the repository. Cold, wet weather also hindered drying the tailings prior to compaction. Dry tailings from the vat area and dry soil was blended with the wet tailings to reduce the overall moisture content. In general, the soil blending was successful but some areas of the repository remained wet and did not meet compaction standards. However, the depth of tailings is shallow (approximately 5 feet average depth), the slopes are relatively flat (the steepest slope is 7:1 and the majority is 5 to 7 percent), and the future land use in the repository does not include loading from structures. Therefore, the wet areas, which constitute a small portion of the repository, should not compromise the functionality and long-term stability of the repository. The only other option would have been to leave the repository through the winter, allow it to dry out, and complete it in the summer of 1998. This option would have left the repository vulnerable to erosion from spring runoff, and would have resulted in extra costs to secure the site for the winter and remobilize to complete the project the following summer. The project was completed on schedule at a cost less than the original contract price.

6.2 SITE CONDITION AFTER COMPLETION

The areas targeted for reclamation at the Empire Mine have been reclaimed and the hazards associated with the site have been mitigated.

6.3 MAINTENANCE OR FOLLOW-UP

Inspection and maintenance of the site will be the most critical in the first two years following reclamation. The site is most vulnerable to erosion until the vegetation is well established. The site should be inspected after spring runoff in 1998. Items that should be inspected include:

- checking the stability of the capped floodplain tailings, repository, and waste rock pile surfaces and slopes;
- checking for subsidences in the capped floodplain tailings, repository, and waste rock piles;
- checking the stability of the runon control ditches;
- evaluating the stability and performance of the riprap drop structures;
- checking for erosion of the borrow areas;
- evaluating the success of the revegetation efforts; and
- checking the integrity of the fencing.

Maintenance should be completed as needed to repair excessive erosion and reseed areas that are not adequately revegetated. An inspection in late June or July should be after the seasonal peak runoff has occurred, and would allow time to complete required maintenance and allow seeding in the fall.

MDEQ/MWCB typically develops site-specific Operation and Maintenance Plans for reclaimed mine sites. Specific procedures for inspection and maintenance will be presented in a written report and a contractor will be procured by MDEQ/MWCB for implementing the inspection and maintenance programs.

6.4 CONSTRUCTION BID PACKAGE

Copies of the design drawings, which were provided in the bid package, are located in Appendix H. These drawings represent the reclamation engineering design from which the bids were prepared and the project was constructed.

6.5 AS-BUILT DRAWINGS

In general, the project was constructed as shown on the design drawings. The main exception was that less tailings were excavated than originally planned because of excessive moisture caused by springs (see description in Section 6.1). However, this did not significantly change the final floodplain grading from the design grading plan.

To adequately prepare as-built drawings for the project, a final topographic survey of the tailings piles, waste rock piles, and repository would be required. A final survey was not needed to determine quantities for payment. MDEQ decided that, since the changes from the design drawings that were made during construction were minor, a final survey was an unnecessary expense that would not enhance the project. Therefore, the as-built drawings in Appendix I are intended to show the locations of runon/runoff control features, fences, borrow areas, and other site features, but do not necessarily reflect the as-built topography; however, the as-built topography generally does not differ significantly from the design drawings.

7.0 COMMENTS/SUGGESTIONS

The Empire Mine Reclamation Project was completed on schedule and within the engineers estimate. All project objectives were met as specified. Rich-Mark Corp., who completed all of the on-site work except for the fencing, was satisfactorily prepared with equipment and a well-supervised work force to perform the tasks required for completion of the project. The following suggestions are intended to help prevent minor problems from recurring on future projects.

The prime contractor, ERNW, had no representatives on site during the project. All on-site communication was with supervisors from Rich-Mark Corp. The lack of contact with the prime contractor created miscommunication at project startup relating to scheduling and the use of subcontractors. Mobilization was slower than indicated by ERNW, which created concerns on the part of MWCB and Olympus. The special provisions require that the contractor have supervisory personnel on site at all times as his contact person with the Owner's representative; however, this provision does not state that the supervisory personnel be a representative of the prime contractor. MWCB should consider revising the special provision to specify that the prime contractor have supervisory personnel on site at all times.

All on-site work was completed by subcontractors, which also led to lack of communication with the prime contractor. MWCB should consider revising the specifications to limit the amount of work that is completed by subcontractors, which would better ensure that the prime contractor to has an active role in the project.

There were no significant disputes raised by the contractor with the description of work or technical specifications as written. There was confusion, however, with the organic amendment specification as to defining which alternate suppliers were acceptable. MWCB should consider revising specifications for organic amendment to include parameters such as carbon to nitrogen ration, organic carbon content, and other physical parameters, as well as supplying a list of suppliers whose product meets the specifications.

A dispute was raised by ERNW's compost supplier, Eko Compost of Missoula, regarding the quantity measured versus the quantity they delivered. The project specifications stated that the quantity of organic compost would be measured in equivalent dry tons. This was accomplished by collecting a representative 5-point composite sample from each compost load, having the moisture content of the samples analyzed by a qualified laboratory, and converting the weight of each compost load to an equivalent dry weight. Based on the weight tickets provided by Eko Compost , the delivery truck tare weight, and the results of the moisture samples, the equivalent dry weight of compost delivered was 111.0 tons, which was less than the contract quantity of 120 dry tons. Since organic amendment was an "actual quantity" pay item, payment was only made for 111.0 dry tons. Eko Compost contacted Olympus to dispute the 111 dry ton measurement and stated that they sell their product by the cubic yard not the dry ton and wanted payment for the 506 cubic yards that say they delivered. Olympus responded by saying that the contract specified that measurement and payment was by the dry ton and that they were a supplier to ERNW and would have to take the matter up with them.

Based on this experience, Olympus recommends that if the organic amendment specifications are revised in the future that the measurement and payment continue to be by the equivalent dry ton. The compost weight and moisture content are easy and inexpensive parameters to measure and should provide accurate results. Measurement by volume (i.e., cubic yards) is difficult to determine and, because of varying density (i.e., fluffing), depends on the degree of compaction which can change dramatically. Thus, this method of measurement increases the potential for disputes.

8.0 PHOTOGRAPHS

Photographs taken to document the work performed are included in Appendix J. An index of the photographs, with a description of each photo is included with the photographs.

APPENDIX A

PRE-BID CONFERENCE MEETING MINUTES

OLYMPUS
ENVIRONMENTAL, INC.

INTEROFFICE MEMO

To: Empire Mine Reclamation Project File – Work Order 97-7049-7

From: Kevin S. Rauch

Date: August 7, 1997

Subject: Pre-Bid Conference Minutes

The pre-bid conference for the Empire Mine Reclamation Project was held Wednesday August 6, 1997 at the project site. Representatives at the meeting included Joel Chavez (MDEQ/MWCB), Kevin Rauch and Dustin Wasley of Olympus, and 9 potential contractors (see attached sign up sheet).

Joel Chavez opened the meeting with a general overview of the project including bonding and insurance requirements. The meeting was then turned over to Kevin Rauch to present the scope of work outlined in the bid package. After the overview, a tour of the site was given starting on tailings pile TP-1, proceeding down to TP-2 along the proposed diversion alignment. The tailings removal and reclamation plans were discussed along the way.

The participants carpooled to the waste rock piles and repository. The waste rock grading plans were reviewed and discussed at each pile. Cover soil for the waste rock piles was discussed. No on-site borrow area has been identified for covering the waste rock piles, and the contractor is responsible for finding a suitable off-site source that meets the cover soil specifications. The placer tailing piles at the Grady Ranch were identified as a possible source and have been accepted by MWCB as suitable. Todd Grady of the Grady Ranch was present at the meeting and offered to sell the placer tailing material to contractors for a price of $1.00 per cubic yard.

The approximate repository boundaries, clearing and grubbing, excavation, subgrade preparation, grading and compaction, and repository cap construction were discussed.

Questions were asked by contractors and answered during the site tour. The following is a list of the questions and answers documented during conference:

Q. What is the length of the stream diversion?

A. The temporary stream diversion is approximately 1400 feet long.

Q. Can a contractor add lime to the wet tailings to help dry them out?

A. Yes, but the cost of lime and volume expansion (i.e., increased volume of the repository) is incidental and will be at the contractors expense.

Q. Who will provide the grade control on the stream?

A. Olympus will provide surveying and grade control.

Q. How long of a haul is it from Grady's borrow source?

A. Approximately 9 miles.

Q. Are the tailings on the abandoned road, south of the tailings piles, going to be removed?

A. No. Only tailings in the floodplain required to achieve a 40-foot wide floodplain with 5:1 adjacent slopes and the vat area tailings are planned for removal. The tailings on the abandoned road are outside of the floodplain excavation area; however, tailings that are excavated to install the diversion pipe and runon control ditch should be hauled to the repository. Tailings outside of the floodplain excavation area that are exposed will be covered with cover soil.

Q. Do we want to touch the stream around the 6+00 section. The stream is spread out and wider than 5 feet?

A. The design calls for removing tailings from the floodplain except for a 5-foot width in the vicinity of the stream channel. For the purposes of the bid, assume that all but 5 feet in the vicinity of the stream channel will be excavated. Areas where the stream is spread out will be evaluated during excavation and well vegetated areas with little or no tailings may be left.

Q. What volume of tailings is going into the repository?

A. The design quantity per the specifications is 6,950 bank cubic yards.

Q. Does the contractor have any road improvement responsibilities on the haul road from Grady's borrow source?

A. Yes. The contractor will be responsible for repairing damage and/or degradation to the county road caused by hauling or other activity associated with the contract. The contractor will also be responsible for dust control on the county road. An addendum will be issued to clarify.

Q. What about bridges on county road? One has a 10-ton weight limit which will not support haul truck traffic.

A This will be evaluated and addressed in an amendment.

Q. Where is the on-site borrow source?

A. The terrace (old road) east of the mill foundation extending east to the limits identified on the drawings.

Q. Does the contractor have to remove the steel from the mill foundation area?

A. Yes.

Q. Who will perform the compaction testing?

A. Olympus will perform the compaction testing.

Q. What is the optimum moisture of the wet tailings?

A. Moisture/density tests show that the optimum moisture is around 20%.

Q. What trees will come out of the repository area?

A. The approximate boundary of the repository was shown. All trees within the repository footprint must be removed plus an additional 10 to 15 foot width for the runon control ditch.

Q. What will the contractor do with the tree roots?

A. The tree roots can be burned with wood debris or possibly buried in an area on site.

Q. Is pollution liability insurance and HazMat training required?

A. Yes.

Q. How much will be graded in the Waste Rock Piles?

A. Approximately 2830 cubic yards at WR-1 and 2130 cubic yards at WR-2.

Q. What does the contractor do with the large metal items on WR-2 (old boiler and compressor)?

A. These items can be moved over by the building on the south side of WR-2 and do not have to be hauled off site.

Q. Does the cover soil on WR-1 get amended?

A. Yes, the top 6 inches.

The conference ended about 12:00 p.m.

NAMES OF PERSONS ATTENDING

☒ PREBID CONFERENCE
☐ PRECONSTRUCTION CONFERENCE
☐ MONTHLY MEETING

FOR Empire Mine Reclamation PROJECT

Lewis and Clark COUNTY, MT - MONT A/E or DSL-AMRB 470035

DATE: 8/6/97 TIME: 0900 hrs.

Name	Address	Affiliation	Telephone Number
Gerald Allen	2388 Kelsey Ln Stev. MT	Allen Excavating.	406-777-2527
Rod DeBuff	RR 2 Box 2341 A Lewistown mt.	DeBCon Inc.	406-538-3197
Kris Paffhausen	P.O. Box 3809, Butte, MT	ERNW	406-782-0463
	PO Box 682 E Helena	Concrete & Septic Tanks Etc	406-227-6806
	" " " "	" " "	406-475-3571 - 431-2762
Larry Bowser	P.O. Box 815 Hilger	Montgomery Const.	406-538-9811
Joe Warner	P.O. Box 128 Clancy MT	Glacier Gold Compost	(406) 881-3030
Ed Baxter	4014 Hardin Rd. Billings	Baxter Const.	406 259 6404
Wayne Allen	PO. Box 4695 Helena	High Mountain Cons.	406. 443- 1821
Monte Weeden	Box 1164 Lewistown, MT 59457	Weeden Construction	[illegible]

APPENDIX B

BID TABULATIONS

Empire Mine Reclamation Project
Lewis and Clark County

DEQ- AMRB No. 470035
DATE: 8/18/97

BID TABULATIONS				ERNW, LLC		M.K. WEEDEN CONSTRUCTION		MC-3 CONSTRUCTION		BAXTER CONSTRUCTION	
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
1.	1	L.S.	MOBILIZATION, BONDING, AND INSURANCE	$8,500.00	$8,500.00	$23,088.00	$23,088.00	$11,747.00	$11,747.00	$41,500.00	$41,500.00
2.			ROAD IMPROVEMENTS								
	4200	L.F.	On-Site Road Improvements	$2.00	$8,400.00	$0.60	$2,520.00	$1.00	$4,200.00	$2.00	$8,400.00
	100	1,000 gallons	Apply Dust Control	$3.00	$300.00	$25.00	$2,500.00	$50.00	$5,000.00	$25.00	$2,500.00
3.	1400	L.F.	CONSTRUCT RUNON TAILINGS PILE RUNON CONTROL DITCH	$1.50	$2,100.00	$1.50	$2,100.00	$5.00	$7,000.00	$1.00	$1,400.00
4.	1	L.S.	TEMPORARY STREAM DIVERSION	$5,300.00	$5,300.00	$28,700.00	$28,700.00	$3,000.00	$3,000.00	$25,000.00	$25,000.00
5.	1	L.S.	CLEARING AND GRUBBING	$1,100.00	$1,100.00	$2,800.00	$2,800.00	$3,000.00	$3,000.00	$2,500.00	$2,500.00
6.	1	L.S.	DEMOLITION AND DISPOSAL OF CONCRETE FOUNDATIONS	$3,200.00	$3,200.00	$3,500.00	$3,500.00	$3,000.00	$3,000.00	$3,500.00	$3,500.00
7.	1	L.S.	WOOD AND METAL DEBRIS REMOVAL	$2,500.00	$2,500.00	$5,660.00	$5,660.00	$5,000.00	$5,000.00	$12,000.00	$12,000.00
8.	2900	C.Y.	REPOSITORY EXCAVATION	$3.00	$8,700.00	$0.85	$2,465.00	$3.00	$8,700.00	$1.50	$4,350.00

BID TABULATIONS				ERNW, LLC		M.K. WEEDEN CONSTRUCTION		MC-3 CONSTRUCTION		BAXTER CONSTRUCTION	
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
9.	120	Dry Tons	ORGANIC AMENDMENT	$30.00	$3,600.00	$125.00	$15,000.00	$150.00	$18,000.00	$92.50	$11,100.00
10.	4170	S.Y.	PREPARE REPOSITORY SUBGRADE	$1.00	$4,170.00	$0.50	$2,085.00	$1.00	$4,170.00	$0.50	$2,085.00
11.			FLOODPLAIN EXCAVATION AND GRADING								
	6950	C.Y.	Excavate Tailings, Haul and Place In Repository	$3.10	$21,545.00	$4.50	$31,275.00	$7.00	$48,650.00	$6.50	$45,175.00
	1.5	Acres	Floodplain Grading	$1,100.00	$1,650.00	$1,000.00	$1,500.00	$1,000.00	$1,500.00	$1,000.00	$1,500.00
12.	3760	C.Y.	CONSTRUCT REPOSITORY CAP	$3.10	$11,656.00	$1.40	$5,264.00	$2.00	$7,520.00	$1.50	$5,640.00
13.	3790	C.Y.	BACKFILL AND GRADE TAILINGS EXCAVATIONS	$3.10	$11,749.00	$4.50	$17,055.00	$2.00	$7,580.00	$4.50	$17,055.00
14.			CONSTRUCT DROP STRUCTURES								
	440	S.Y.	Filter Fabric	$1.20	$528.00	$1.80	$792.00	$1.00	$440.00	$1.50	$660.00
	80	C.Y.	Gravel Cushion	$26.00	$2,080.00	$15.00	$1,200.00	$30.00	$2,400.00	$24.00	$1,920.00
	380	C.Y.	Riprap	$20.00	$7,600.00	$20.00	$7,600.00	$30.00	$11,400.00	$20.00	$7,600.00
15.	4960	C.Y.	WASTE ROCK GRADING	$1.00	$4,960.00	$0.90	$4,464.00	$2.00	$9,920.00	$2.00	$9,920.00
16.	2070	C.Y.	COVER SOIL APPLICATION TO WASTE ROCK PILES	$8.00	$16,560.00	$5.00	$10,350.00	$15.00	$31,050.00	$11.75	$24,322.50

BID TABULATIONS				ERNW, LLC		M.K. WEEDEN CONSTRUCTION		MC-3 CONSTRUCTION		BAXTER CONSTRUCTION	
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
17.	1830	L.F.	CONSTRUCT RUNON DIVERSION AROUND REPOSITORY AND WASTE ROCK PILES	$3.00	$5,490.00	$1.50	$2,745.00	$3.00	$5,490.00	$1.00	$1,830.00
18.	5.8	Acres	FERTILIZING SEEDING	$2,500.00	$14,500.00	$1,200.00	$6,960.00	$700.00	$4,060.00	$800.00	$4,640.00
19.	4.0	Acre	MULCH	$500.00	$2,000.00	$600.00	$2,400.00	$300.00	$1,200.00	$1,000.00	$4,000.00
20.	6930	S.F.	INSTALL EROSION CONTROL MAT	$1.00	$6,930.00	$1.00	$13,860.00	$1.00	$6,930.00	$2.85	$19,750.50
21.			CONSTRUCT FENCES								
	6300	L.F.	4 Strand Barbed-Wire Fence	$7.00	$44,100.00	$2.00	$12,600.00	$1.50	$9,450.00	$3.50	$22,050.00
	860	L.F.	Cattle/Hog Panel Fence	$10.00	$8,600.00	$6.80	$5,848.00	$3.00	$2,580.00	$4.50	$3,870.00
22.	2800	L.F.	RECLAIM TEMPORARY ROADWAYS	$1.50	$4,200.00	$1.00	$2,800.00	$1.00	$2,800.00	$0.65	$1,820.00
23.			OBTAIN MPDES STORMWATER PERMIT								
	1	L.S.	Discharge Permit	$650.00	$650.00	$650.00	$650.00	$650.00	$650.00	$650.00	$650.00
	100	EACH	Straw Bales	$10.00	$1,000.00	$9.00	$900.00	$20.00	$2,000.00	$12.00	$1,200.00
	1000	L.F.	Silt Fence	$3.50	$3,500.00	$2.25	$2,250.00	$2.00	$2,000.00	$1.75	$1,750.00
TOTAL					$217,168.00		$220,931.00		$230,437.00		$289.688.00

Empire Mine Reclamation Project
Lewis and Clark County

DEQ- AMRB No. 470035
DATE: 8/18/97

BID TABULATIONS				DEBCON, INC.		HIGH MOUNTAIN CONSTRUCTION		CONCRETE SEPTIC TANK COMPANY		MONTGOMERY CONSTRUCTION	
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
1.	1	L.S.	MOBILIZATION, BONDING, AND INSURANCE	$30,000.00	$30,000.00	$50,000.00	$50,000.00	$41,368.00	$41,368.00	$52,400.00	$52,400.00
2.			ROAD IMPROVEMENTS								
	4200	L.F.	On-Site Road Improvements	$0.50	$2,100.00	$1.50	$6,300.00	$1.04	$4,368.00	$1.00	$4,200.00
	100	1,000 gallons	Apply Dust Control	$30.00	$3,000.00	$50.00	$5,000.00	$20.00	$2,000.00	$20.00	$2,000.00
3.	1400	L.F.	CONSTRUCT RUNON TAILINGS PILE RUNON CONTROL DITCH	$2.00	$2,800.00	$1.75	$2,450.00	$4.68	$6,552.00	$10.00	$14,000.00
4.	1	L.S.	TEMPORARY STREAM DIVERSION	$20,000.00	$20,000.00	$22,800.00	$22,800.00	$33,440.00	$33,440.00	$26,000.00	$26,000.00
5.	1	L.S.	CLEARING AND GRUBBING	$10,000.00	$10,000.00	$6,000.00	$6,000.00	$5,836.00	$5,836.00	$10,000.00	$10,000.00
6.	1	L.S.	DEMOLITION AND DISPOSAL OF CONCRETE FOUNDATIONS	$2,000.00	$2,000.00	$5,000.00	$5,000.00	$5,015.00	$5,015.00	$8,000.00	$8,000.00
7.	1	L.S.	WOOD AND METAL DEBRIS REMOVAL	$5,000.00	$5,000.00	$16,000.00	$16,000.00	$16,145.00	$16,145.00	$10,000.00	$10,000.00
8.	2900	C.Y.	REPOSITORY EXCAVATION	$1.00	$2,900.00	$1.50	$4,350.00	$1.85	$5,365.00	$3.45	$10,005.00

BID TABULATIONS				DEBCON, INC.		HIGH MOUNTAIN CONSTRUCTION		CONCRETE SEPTIC TANK COMPANY		MONTGOMERY CONSTRUCTION	
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
9.	120	Dry Tons	ORGANIC AMENDMENT	$100.00	$12,000.00	$220.00	$26,400.00	$29.00	$3,480.00	$181.00	$21,720.00
10.	4170	S.Y.	PREPARE REPOSITORY SUBGRADE	$1.00	$4,170.00	$1.35	$5,629.50	$0.83	$3,461.10	$0.60	$2,502.00
11.			FLOODPLAIN EXCAVATION AND GRADING								
	6950	C.Y.	Excavate Tailings, Haul and Place In Repository	$6.00	$41,700.00	$6.50	$45,175.00	$11.90	$82,705.00	$8.00	$55,600.00
	1.5	Acres	Floodplain Grading	$5,000.00	$7,500.00	$720.00	$1,080.00	$6,490.00	$9,735.00	$15,000.00	$22,500.00
12.	3760	C.Y.	CONSTRUCT REPOSITORY CAP	$1.50	$5,640.00	$5.00	$18,800.00	$2.97	$11,167.20	$3.00	$11,280.00
13.	3790	C.Y.	BACKFILL AND GRADE TAILINGS EXCAVATIONS	$6.00	$22,740.00	$11.00	$41,690.00	$7.00	$26,530.00	$5.00	$18,950.00
14.			CONSTRUCT DROP STRUCTURES								
	440	S.Y.	Filter Fabric	$2.00	$880.00	$4.50	$1,980.00	$1.80	$792.00	$3.00	$1,320.00
	80	C.Y.	Gravel Cushion	$30.00	$2,400.00	$26.00	$2,080.00	$5.95	$476.00	$40.00	$3,200.00
	380	C.Y.	Riprap	$40.00	$15,200.00	$16.00	$6,080.00	$24.30	$9,234.00	$30.00	$11,400.00
15.	4960	C.Y.	WASTE ROCK GRADING	$3.00	$14,880.00	$1.80	$8,928.00	$2.50	$12,400.00	$2.50	$12,400.00
16.	2070	C.Y.	COVER SOIL APPLICATION TO WASTE ROCK PILES	$7.00	$14,490.00	$12.50	$25,875.00	$9.43	$19,520.10	$5.00	$10,350.00

BID TABULATIONS				DEBCON, INC.		HIGH MOUNTAIN CONSTRUCTION		CONCRETE SEPTIC TANK COMPANY		MONTGOMERY CONSTRUCTION	
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
17.	1830	L.F.	CONSTRUCT RUNON DIVERSION AROUND REPOSITORY AND WASTE ROCK PILES	$2.00	$3,660.00	$1.90	$3,477.00	$1.30	$2,379.00	$3.00	$5,490.00
18.	5.8	Acres	FERTILIZING SEEDING	$2,000.00	$11,600.00	$1,200.00	$6,960.00	$708.00	$4,106.40	$2,000.00	$11,600.00
19.	4.0	Acre	MULCH	$1,000.00	$4,000.00	$1,800.00	$7,200.00	$2,133.00	$8,532.00	$1,000.00	$4,000.00
20.	6930	S.F.	INSTALL EROSION CONTROL MAT	$2.00	$13,860.00	$0.30	$2,079.00	$1.90	$13,167.00	$3.00	$20,790.00
21.			CONSTRUCT FENCES								
	6300	L.F.	4 Strand Barbed-Wire Fence	$4.00	$25,200.00	$2.80	$17,640.00	$1.60	$10,080.00	$3.00	$18,900.00
	860	L.F.	Cattle/Hog Panel Fence	$10.00	$8,600.00	$6.00	$5,160.00	$5.70	$4,902.00	$4.00	$3,440.00
22.	2800	L.F.	RECLAIM TEMPORARY ROADWAYS	$0.50	$1,400.00	$0.95	$2,660.00	$0.90	$2,520.00	$0.90	$2,520.00
23.			OBTAIN MPDES STORMWATER PERMIT								
	1	L.S.	Discharge Permit	$650.00	$650.00	$650.00	$650.00	$650.00	$650.00	$650.00	$650.00
	100	EACH	Straw Bales	$5.00	$500.00	$10.00	$1,000.00	$6.50	$650.00	$10.00	$1,000.00
	1000	L.F.	Silt Fence	$2.00	$2,000.00	$3.50	$3,500.00	$0.62	$620.00	$2.00	$2,000.00
TOTAL					$290,870.00		$351,943.50		$347,195.80		$378,217.00

Empire Mine Reclamation Project
Lewis and Clark County

DEQ- AMRB No. 470035
DATE: 8/18/97

BID TABULATIONS				AJAX CONTRACTING, INC.							
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
1.	1	L.S.	MOBILIZATION, BONDING, AND INSURANCE	$81,000.00	$81,000.00						
2.			ROAD IMPROVEMENTS								
	4200	L.F.	On-Site Road Improvements	$7.00	$29,400.00						
	100	1,000 gallons	Apply Dust Control	$12.50	$1,250.00						
3.	1400	L.F.	CONSTRUCT RUNON TAILINGS PILE RUNON CONTROL DITCH	$15.00	$21,000.00						
4.	1	L.S.	TEMPORARY STREAM DIVERSION	$15,000.00	$15,000.00						
5.	1	L.S.	CLEARING AND GRUBBING	$10,000.00	$10,000.00						
6.	1	L.S.	DEMOLITION AND DISPOSAL OF CONCRETE FOUNDATIONS	$10,000.00	$10,000.00						
7.	1	L.S.	WOOD AND METAL DEBRIS REMOVAL	$15,000.00	$15,000.00						
8.	2900	C.Y.	REPOSITORY EXCAVATION	$4.00	$11,600.00						

BID TABULATIONS				AJAX CONTRACTING, INC.							
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
9.	120	Dry Tons	ORGANIC AMENDMENT	$150.00	$18,000.00						
10.	4170	S.Y.	PREPARE REPOSITORY SUBGRADE	$1.00	$4,170.00						
11.			FLOODPLAIN EXCAVATION AND GRADING								
	6950	C.Y.	Excavate Tailings, Haul and Place In Repository	$15.00	$104,250.00						
	1.5	Acres	Floodplain Grading	$5,000.00	$7,500.00						
12.	3760	C.Y.	CONSTRUCT REPOSITORY CAP	$13.50	$50,760.00						
13.	3790	C.Y.	BACKFILL AND GRADE TAILINGS EXCAVATIONS	$20.00	$75,800.00						
14.			CONSTRUCT DROP STRUCTURES								
	440	S.Y.	Filter Fabric	$3.00	$1,320.00						
	80	C.Y.	Gravel Cushion	$75.00	$6,000.00						
	380	C.Y.	Riprap	$60.00	$22,800.00						
15.	4960	C.Y.	WASTE ROCK GRADING	$8.00	$39,680.00						
16.	2070	C.Y.	COVER SOIL APPLICATION TO WASTE ROCK PILES	$17.50	$36,225.00						

BID TABULATIONS				AJAX CONTRACTING, INC.							
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
17.	1830	L.F.	CONSTRUCT RUNON DIVERSION AROUND REPOSITORY AND WASTE ROCK PILES	$5.00	$9,150.00						
18.	5.8	Acres	FERTILIZING SEEDING	$2,500.00	$14,500.00						
19.	4.0	Acre	MULCH	$4,000.00	$16,000.00						
20.	6930	S.F.	INSTALL EROSION CONTROL MAT	$2.50	$17,325.00						
21.			CONSTRUCT FENCES								
	6300	L.F.	4 Strand Barbed-Wire Fence	$3.00	$18,900.00						
	860	L.F.	Cattle/Hog Panel Fence	$3.50	$3,010.00						
22.	2800	L.F.	RECLAIM TEMPORARY ROADWAYS	$10.00	$28,000.00						
23.			OBTAIN MPDES STORMWATER PERMIT								
	1	L.S.	Discharge Permit	$650.00	$650.00						
	100	EACH	Straw Bales	$15.00	$1,500.00						
	1000	L.F.	Silt Fence	$5.00	$5,000.00						
TOTAL					$674,790.00						

APPENDIX C

PROJECT START-UP FORMS

NOTICE OF AWARD

TO: ERNW, LLC.
P.O. Box 3809

Butte, MT 59702

DATE: August 14, 1997
PROJECT: Empire Mine Reclamation Project
DEQ: 470035

PROJECT DESCRIPTION: Mine Reclamation

The Owner has considered the Bid submitted by you for the above-described Work in response to its Invitation for Bid dated August 14, 1997.

You are hereby notified that your bid has been accepted, based on a tabulation of the Bid Items.

You are required by the Instructions to Bidders to execute the Agreement and furnish the required Certificate of Workman's Compensation within 15 calendar days from the date of this Notice.
If you fail to execute said Agreement within 15 days from the date of this Notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your Bid as abandoned and as forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner.

Dated this 18 day of August, 1997.

OWNER: DEPARTMENT OF ENVIRONMENTAL QUALITY

By: Forest V. F

Title: Forest Farris, Contract Officer

ACCEPTANCE OF NOTICE OF AWARD

Receipt of the above Notice of Award is hereby acknowledged this 19th day of August, 199~~6~~7.

CONTRACTOR: ERNW, LLC

By: Kris Paffhausen

Title: Managing Director

NOTICE TO PROCEED

TO: Environmental Reclamtion Northwest, LLC.
P.O. Box 3809
Butte, MT 59702

Date 9/2/97

PROJECT: Empire Mine Reclamation

DEQ -MWCB 470035

In accordance with the Agreement dated August 19, 1997, you are hereby notified to commence work no later than September 8, 1997, and you are to complete the work within 60 consecutive calender days thereafter. The date of completion of the work is therefore November 6, 1997.

OWNER: DEPARTMENT OF ENVIRONMENTAL QUALITY

By: Vic R Andersen

Title:

ACCEPTANCE OF NOTICE TO PROCEED

Receipt of the above Notice to Proceed is hereby acknowledged this 4th day of September - ___, 1997.

CONTRACTOR: ERNW, LLC

By: Kristina Pfaffhausen

Title: Managing Director

APPENDIX D

CHANGE ORDERS

CHANGE ORDER

ORDER NO. 1

PROJECT TITLE: Empire Mine Reclamation Project

DEQ No.: 470035

CONTRACT DATE: September 8, 1997

OWNER: Montana Department of Environmental Quality – Mine Waste Cleanup Bureau

CONTRACTOR: Environmental Reclamation Northwest, LLC

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment, and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES-ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MATL'S	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
2	Add 1,550 ft road improvement					$2.00	$3,100.00
2	Deduct Dust Control (100 @1,000 gallons)					$3.00	($300.00)
3	Deduct 360 ft Tailings Pile Runon Ditch					$1.50	($540.00)
9	Deduct 9 dry tons organic amendment					$30.00	($270.00)
17	Deduct 605 ft Repos/WR Runon Ditch					$3.00	($1,815.00)
20	Deduct 1,410 S.Y. Erosion Control Mat					$1.00	($1,410.00)
21	Deduct 1,932 ft 4-Strand Barb. Wire Fence					$7.00	($13,524.00)
21	Add 100 ft Cattle/Hog Panel Fence					$10.00	$1,000.00
22	Add 200 ft Reclaim Temporary Roadways					$1.50	$300.00
23	Deduct 88 Straw Bales					$10.00	($880.00)
23	Add 500 ft Silt Fence					$3.50	$1,750.00

TOTAL COST - MATERIALS, LABOR, EQUIPMENT & MISC.	($12,589.00)
OVERHEAD & PROFIT@ Included%	- 0 -
GRAND TOTAL - THIS CHANGE ORDER	($12,589.00)

Original Contract Price	$217,168.00
Current Contract Price Adjusted by Previous Change Order	$217,168.00
Cost this Change Order (+ or -_)	($12,589.00)
New Contract Price including this Change Order	$204,579.00

The completion date as set forth in the Contract Documents shall be ([✓ unchanged], increased, decreased) by - 0 - calendar days.

The date for completion of all work will be November 6, 1997 .

Description and Justification for Change:

1. Adjustments for changes in actual quantity bid items.

SURETY CONSENT

The Surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The Principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bonds or Bonds is hereby increased by $__________ (100% of the Change Order amount) and the penalty of the applicable Labor and Material Bond or Bonds is hereby increased by $ __________ (100% of the Change Order amount).

COUNTERSIGNED BY MONTANA RESIDENT AGENT

SURETY

____

By: ____________________

Seal

Recommended by: __________ Engineer 11/11/97 Date

Accepted by: __________ Contractor 12/18/97 Date

Approved by: __________ Owner 12/30/97 Date

ok

APPENDIX E

PAYMENT REQUEST FORMS

PAYMENT REQUEST NO. 1

FROM 9/9/97 TO 10/30/91

PROJECT TITLE: Empire Mine Reclamation Project

LOCATION: Lewis & Clark County, Montana DEQ No.: 470035

NAME OF CONTRACTOR: ERNW, LLC

ADDRESS: P.O. Box 3809, Butte, MT 59702

SUMMARY OF PROJECT STATUS

Amount of Original Contract		$ 217,168.00
Change Order No. ____	$	
Change Order No. ____	$	
Change Order No. ____	$	
Amount of Approved Change Order(s)		$ -0-
TOTAL CONTRACT AMOUNT		$ 217,168.00

Pay Request No.	Amount of Request
1	163,204.00

Total Contract Amount Completed to Date	$ 163,204.00
Less Retainage (10 %)	$ 16,320.40
TOTAL AMOUNT EARNED TO DATE	$ 146,883.60
Less Previous Payments	$ -0-
AMOUNT DUE THIS PAYMENT	$ 146,883.60
Less 1% Tax	$ 1,468.84
TOTAL DUE CONTRACTOR	$ 145,414.76

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

ERNW, LLC
Contractor

By Kris Paffhausen

Date 11/3/97

RECOMMENDED BY:

Olympus Environmental, Inc.
Engineer

By

Date 11-5-97

APPROVED BY:

Department of Environmental Quality,
Mine Waste Cleanup Bureau
Owner

By Vic R Andersen

Date 11-5-97

ok

RC 4138193 11/5/97

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed to Date	Total Contract Amount Completed to Date	Amount Due this Payment
1	Mob, Bond, Ins.	1	8,500.00	- 0 -	0.8	0.8	6,800.00	6,800.00
2	Road Improve							
	On-Site Rd Imp	4,200	2.00	- 0 -	4,200	4,200	8,400.00	8,400.00
	Dust Control	100	3.00	- 0 -	0	0	- 0 -	- 0 -
3	Tailings Runon Control Ditch	1,400	1.50	- 0 -	1,040	1,040	1,560.00	1,560.00
4	Temporary Stream Diversion	1	5,300.00	- 0 -	1	1	5,300.00	5,300.00
5	Clear and Grub	1	1,100.00	- 0 -	1	1	1,100.00	1,100.00
6	Demo/Dispose Concrete Found	1	3,200.00	- 0 -	1	1	3,200.00	3,200.00
7	Wood/Metal Debris Removal	1	2,500.00	- 0 -	0	0	- 0 -	- 0 -
8	Repository Exc.	2,900	3.00	- 0 -	2,900	2,900	8,700.00	8,700.00
9	Organic Amend.	120	30.00	- 0 -	111	111	3,330.00	3,330.00
10	Prepare Repos. Subgrade	4,170	1.00	- 0 -	4,170	4,170	4,170.00	4,170.00
11	Floodplain Exc. and Grading							
	Exc/Haul/Place in Repository	6,950	3.10	- 0 -	6,950	6,950	21,545.00	21,545.00
	Floodplain Grad.	1.5	1,100.00	- 0 -	1.5	1.5	1,650.00	1,650.00
12	Construct Repository Cap	3,760	3.10	- 0 -	3,760	3,760	11,656.00	11,656.00
13	Backfill/Grade Tailings Exc.	3,790	3.10	- 0 -	3,790	3,790	11,749.00	11,749.00
14	Const. Drop Str.							
	Filter Fabric	440	1.20	- 0 -	440	440	528.00	528.00
	Gravel Cushion	80	26.00	- 0 -	80	80	2,080.00	2,080.00
	Riprap	380	20.00	- 0 -	380	380	7,600.00	7,600.00
15	Waste Rock Grading	4,960	1.00	- 0 -	4,960	4,960	4,960.00	4,960.00
16	Cover Soil WR	2,070	8.00	- 0 -	2,070	2,070	16,560.00	16,560.00
17	Repos/WR Runon Ditch	1,830	3.00	- 0 -	700	700	2,100.00	2,100.00
18	Fertilize & Seed	5.8	2,500.00	- 0 -	5.8	5.8	14,500.00	14,500.00
19	Mulch	4.0	500.00	- 0 -	4.0	4.0	2,000.00	2,000.00
20	Erosion Mat	6,930	1.00	- 0 -	5,460	5,460	5,460.00	5,460.00
21	Const. Fences							
	Barbed Wire	6,300	7.00	- 0 -	1,998	1,998	13,986.00	13,986.00
	Cattle/Hog Panel	860	10.00	- 0 -	- 0 -	- 0 -	- 0 -	- 0 -
22	Reclaim Temp. Roadways	2,800	1.50	- 0 -	- 0 -	- 0 -	- 0 -	- 0 -
23	MPDES Permit							
	Discharge Permit	1	650.00	- 0 -	1	1	650.00	650.00
	Straw Bales	100	10.00	- 0 -	12	12	120.00	120.00
	Silt Fence	1,000	3.50	- 0 -	1,000	1,000	3,500.00	3,500.00
	Materials on Site (Attach Schedule)	–	–	$	$	–	$	$ –
	TOTALS						$	$163,204.00

PAYMENT REQUEST NO. 2 (Final)

FROM 11/01/97 TO 11/05/97

PROJECT TITLE: Empire Mine Reclamation Project

LOCATION: Lewis & Clark County, Montana DEQ No.: 470035

NAME OF CONTRACTOR: ERNW, LLC

ADDRESS: P.O. Box 3809, Butte, MT 59702

SUMMARY OF PROJECT STATUS

Amount of Original Contract		$ $217,168.00
Change Order No. ____	$ ($12,589.00)	
Change Order No. ____	$	
Change Order No. ____	$	
Amount of Approved Change Order(s)		$ ($12,589.00)
TOTAL CONTRACT AMOUNT		$ $204,579.00

Pay Request No.	Amount of Request
1	$163,204.00
2	$41,375.00

Total Contract Amount Completed to Date	$ 204,579.00
Less Retainage (- 0 - %)	$ - 0 -
TOTAL AMOUNT EARNED TO DATE	$ 204579.00
Less Previous Payments	$ 146,883.60
AMOUNT DUE THIS PAYMENT	$ 57,695.40
Less 1% Tax	$ 576.95
TOTAL DUE CONTRACTOR	$ 57,118.45

ok Joel

12/30/97

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

ERNW, LLC
Contractor

By Kristina Palfhausen

Date 11/14/97

RECOMMENDED BY:

Olympus Environmental Science and Engineering, Inc.
Engineer

By Kim S. Paul

Date 12/30/97

APPROVED BY:

Department of Environmental Quality,
Mine Waste Cleanup Bureau
Owner

By Vic R Andersen

Date 1-8-98

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed to Date	Total Contract Amount Completed to Date	Amount Due This Payment
1	Mob, Bond, Ins.	1	8,500.00	0.8	0.2	1	8,500.00	1,700.00
2	Road Improve							
	On-Site Rd Imp	5,750	2.00	4,200	1,550	5,750	11,500.00	3,100.00
	Dust Control	- 0 -	3.00	- 0 -	- 0 -	- 0 -	- 0 -	- 0 -
3	Tailings Runon Control Ditch	1,040	1.50	1,040	- 0 -	1,040	1,560.00	- 0 -
4	Temporary Stream Diversion	1	5,300.00	1	- 0 -	1	5,300.00	- 0 -
5	Clear and Grub	1	1,100.00	1	- 0 -	1	1,100.00	- 0 -
6	Demo/Dispose Concrete Found	1	3,200.00	1	- 0 -	1	3,200.00	- 0 -
7	Wood/Metal Debris Removal	1	2,500.00	0	1	1	2,500.00	2,500.00
8	Repository Exc.	2,900	3.00	2,900	- 0 -	2,900	8,700.00	- 0 -
9	Organic Amend.	111	30.00	111	- 0 -	111	3,330.00	- 0 -
10	Prepare Repos. Subgrade	4,170	1.00	4,170	- 0 -	4,170	4,170.00	- 0 -
11	Floodplain Exc. and Grading							
	Exc/Haul/Place in Repository	6,950	3.10	6,950	- 0 -	6,950	21,545.00	- 0 -
	Floodplain Grad.	1.5	1,100.00	1.5	- 0 -	1.5	1,650.00	- 0 -
12	Construct Repository Cap	3,760	3.10	3,760	- 0 -	3,760	11,656.00	- 0 -
13	Backfill/Grade Tailings Exc.	3,790	3.10	3,790	- 0 -	3,790	11,749.00	- 0 -
14	Const. Drop Str.							
	Filter Fabric	440	1.20	440	- 0 -	440	528.00	- 0 -
	Gravel Cushion	80	26.00	80	- 0 -	80	2,080.00	- 0 -
	Riprap	380	20.00	380	- 0 -	380	7,600.00	- 0 -
15	Waste Rock Grading	4,960	1.00	4,960	- 0 -	4,960	4,960.00	- 0 -
16	Cover Soil WR	2,070	8.00	2,070	- 0 -	2,070	16,560.00	- 0 -
17	Repos/WR Runon Ditch	1,225	3.00	700	525	1,225	3,675.00	1,575.00
18	Fertilize & Seed	5.8	2,500.00	5.8	- 0 -	5.8	14,500.00	- 0 -
19	Mulch	4.0	500.00	4.0	- 0 -	4.0	2,000.00	- 0 -
20	Erosion Mat	5,520	1.00	5,460	60	5,520	5,520.00	60.00
21	Const. Fences							
	Barbed Wire	4,368	7.00	1,998	2,370	4,368	30,576.00	16,590.00
	Cattle/Hog Panel	960	10.00	- 0 -	960	960	9,600.00	9,600.00
22	Reclaim Temp. Roadways	3,000	1.50	- 0 -	3,000	3,000	4,500.00	4,500.00
23	MPDES Permit							
	Discharge Permit	1	650.00	1	- 0 -	1	650.00	- 0 -
	Straw Bales	12	10.00	12	- 0 -	12	120.00	- 0 -
	Silt Fence	1,500	3.50	1,000	500	1,500	5,250.00	1,750.00
	Materials on Site (Attach Schedule)	–	–				$ –	$ –
	TOTALS	–	–	–	–	–	$204,597.00	$ 41,375.00

APPENDIX F

PROJECT COMPLETION FORMS

CONTRACTOR'S CERTIFICATE OF COMPLETION

TO (Owner): Montana Dept. of	DATE: November 5, 1997
Environmental Quality, Mine Waste	PROJECT TITLE: Empire Mine Reclamation Project
Cleanup Bureau, P.O. Box 200901	Lewis and Clark County, Montana
Helena, Montana 59620-0901	DEQ No.: 470035
ATTN: Joel Chavez	CONTRACT DATE: September 8, 1997

FROM: Environmental Reclamation Northwest, LLC
(Firm or Corporation)

This is to certify that I, KRISTINA PAFFHAUSEN, am an authorized official of ERNW, LLC, working in the capacity of Managing Director and have been properly authorized by said firm or corporation to sign the following statements pertaining to the subject contract:

> I know of my own personal knowledge, and do hereby certify, that the work of the contract described above has been performed, and materials used and installed in every particular, in accordance with, and in conformity to, the Contract Plans and Specifications.
>
> The contract work is now complete in all parts and requirements and ready for your substantial completion inspection.
>
> I understand that neither the determination of the Engineer that the work is complete nor the acceptance thereof by the Owner shall operate as a bar to claim against the Contractor under the terms of the guarantee provisions of the Contract Documents.

CONTRACTOR: Environmental Reclamation Northwest, LLC

By: Kristina Paffhausen Managing Directo
Title

Distribution:
1. Project Manager
2. Field Office
3. File

AFFIDAVIT ON BEHALF OF CONTRACTOR

STATE OF Montana)
: ss
COUNTY OF Lewis and Clark)

DEQ No.: 470035

DATE: November 10, 1995

I certify to the best of my knowledge and belief that all work has been performed and materials supplied in strict conformance with the terms and conditions of the corresponding contract documents between **Montana Department of Environmental Quality, Mine Waste Cleanup Bureau** , the Owner, and **Environmental Reclamation Northwest, LLC**, the Contractor, dated **September 8, 1997** for the **Empire Mine Reclamation Project**, DEQ No.: **470035**, and further declare that all bills for materials, supplies, utilities, and for all other things furnished or caused to be furnished by the above-named Contractor and used in the execution of the above Contract have been fully paid, and there are no unpaid claims or demands of State Agencies, subcontractors, materialmen, mechanics, laborers or any others resulting from or arising out of work done or ordered to be done by said Contractor under the above-identified Contract.

In consideration of the prior and final payments made and all payments made for authorized changes, the Contractor releases and forever discharges the Owner from any and all obligations and liabilities arising by virtue of said Contract and authorized changes between the parties hereto, either verbal or in writing, and any and all claims and demands of every kind and character whatsoever against the Owner, arising out of or in any way relating to said Contract, and authorized changes.

This statement is made for the purpose of inducing the Owner to make Final Payment under the terms of the Contract, relying on the truth and statements contained therein.

Dated this 14th day of November, 1997, at Butte, Montana.

CONTRACTOR: Environmental Reclamation Northwest, LLC

By: Kristina Papphausen
Title: Managing Director

Subscribed and sworn to before me this 14th day of November, 1997.

Mary Ann Sutton
Notary Public for the State of Montana

(SEAL)

Residing at Butte
My commission expires 2/15/2000

CONSENT OF SURETY COMPANY TO FINAL PAYMENT

(From AIA Document G707)

Bond No. 1334823

OWNER ☐
ENGINEER ☐
CONTRACTOR ☐
SURETY ☐
OTHER

PROJECT: Empire Mine Reclamation Project
(name, address) Lewis & Clark County, MT

TO (Owner)
State of Montana, DEQ
1520 E. 6th Avenue
Helena, MT 59601

DEQ NO.: 470035

CONTRACT FOR: Mine Reclamation

CONTRACT DATE: 8/19/97

CONTRACTOR: Environmental Reclamation Northwest, LLC

In accordance with the provisions of the contract between the Owner and the Contractors indicated above, the Amwest Surety Insurance Company, SURETY COMPANY, on bond
(here insert name and address of Surety Company)
of Environmental Reclamation Northwest, LLC, CONTRACTOR, hereby approves of the final
(here insert name and address of Contractor)
payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety Company of any of its obligations to State of Montana, DEQ, OWNER, as set
(here insert name and address of Owner)
forth in the said Surety Company's bond.

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand this 29th day of December, 19 97.

Amwest Surety Insurance Company
Surety Company

Sylvia Tilzey
Signature of Authorized Representative

Sylvia Tilzey, Attorney-in-fact
Title

Attest:
(Seal) Beverly Healy

NOTE: This form is to be used as a companion document to the Affidavit on Behalf of Contractor (current edition).

Rev. 9/95

CERTIFICATE OF SUBSTANTIAL COMPLETION

TO: Montana Department of Environmental Quality, Mine Waste Cleanup Bureau OWNER

PROJECT TITLE: Empire Mine Reclamation Project

DEQ No.: 470035	SUBSTANTIAL COMPLETION DATE: November 5, 1997
CONTRACT DATE: September 8, 1997	DEQ INSPECTION DATE: November 5, 1997
LOCATION: Empire Mine, Lewis and Clark County, Montana	ENGINEER: Kevin S. Rauch, P.E., Olympus Environmental Science & Engineering, Inc., 765 Colleen, Helena, MT 59601
PROJECT OR PART SHALL INCLUDE: All work items for the project as specified in the contract	PERFORMANCE BOND NO: 1334823
	DATE OF BOND: August 19, 1997
	SURETY: Amwest Surety Insurance Company
CONTRACTOR: ERNW, LLC	MONTANA AGENT: Hoiness LaBar Insurance, Inc.
ADDRESS: P.O. Box 3809, Butte, MT 59702	ADDRESS: P.O. Box 30638 Billings, MT 59107-0638
TELEPHONE NO: 406-782-0463	

The Work performed under this Contract has been inspected by authorized representatives of the Owner, Contractor, and Engineer, and the Project (or specified part of the Project, as indicated above) is hereby declared to be substantially completed on the above date.

> **DEFINITION OF SUBSTANTIAL COMPLETION**
>
> The date of substantial completion of a project or specified area of a project is the date when the construction is sufficiently completed, in accordance with the contract documents, as modified by any change order agreed to by the parties, so the Owner can occupy or utilize the project or specified area of the project for the use for which it was intended.

A tentative list of items to be completed is appended hereto. This list may not be exhaustive, and the failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents.

ENGINEER: Olympus Environmental Science and Engineering, Inc.

By Kevin S Rauch 11/11/97
Authorized Representative Date

The Contractor accepts the above Certificate of Substantial Completion and agrees to complete and correct the items on the tentative list within the time indicated.

CONTRACTOR: Environmental Reclamation Northwest, LLC

By 11/4/97
Authorized Representative Date

The Owner accepts the Project or specified area of the Project as substantially complete and will assume full possession of the project or specified area at 5:00 p.m. (time), on November 5, 1997 (date). The responsibility for heat, utilities, security, and insurance under the Contract Documents shall be as set forth under "Remarks" below.

OWNER: MDEQ, Mine Waste Cleanup Bureau

By 12/30/97
Authorized Representative Date

N/A
Remarks: (Attach additional sheet, if necessary)

CERTIFICATE OF ACCEPTANCE

TO: Montana Department of Environmental Quality, Mine Waste Cleanup Bureau OWNER

PROJECT TITLE: Empire Mine Reclamation Project

DEQ No.: 470035
CONTRACT DATE: September 8, 1997
LOCATION: Empire Mine, Lewis and Clark County, Montana
PROJECT OR PART SHALL INCLUDE: All work items for the project as specified in the contract

CONTRACTOR: ERNW, LLC
ADDRESS: P.O. Box 3809
Butte, MT 59702
TELEPHONE NO: 406-782-0463

FINAL ACCEPTANCE DATE: November 5, 1997
DEQ INSPECTION DATE: November 5, 1997
ENGINEER: Kevin S. Rauch, P.E., Olympus Environmental Science & Engineering, Inc., 765 Colleen, Helena, MT 59601
PERFORMANCE BOND NO: 1334823
DATE OF BOND: August 19, 1997
SURETY: Amwest Surety Insurance Company
MONTANA AGENT: Hoiness LaBar Insurance, Inc.

ADDRESS: P.O. Box 30638
Billings, MT 59107-0638

The Work performed under this Contract has been inspected by authorized representatives of the Owner, Contractor, and Engineer, and the Project (or specified part of the Project, as indicated above) is hereby declared to be totally completed and accepted on the above date.

ENGINEER: Olympus Environmental Science and Engineering, Inc.

By Kevin S. Rauch 12/30/97
Authorized Representative Date

The Contractor accepts the above Certificate of Acceptance and agrees to abide by the conditions of the one-year warranty period which began on the substantial completion date.

CONTRACTOR: Environmental Reclamation Northwest, LLC

By Kristina L. Paffhausen 11/14/97
Authorized Representative Date

The Owner accepts the Project as totally complete, and final payment is due to the Contractor as provided in the contract documents.

OWNER: MDEQ, Mine Waste Cleanup Bureau

By 12/30/97
Authorized Representative Date

APPENDIX G

ENGINEERING COST ANALYSIS

ANALYSIS OF ENGINEERING COSTS INCURRED
FOR THE MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
MINE WASTE CLEANUP BUREAU
MDEQ/MWCB PROJECT NUMBER: DEQ 470035
EMPIRE MINE RECLAMATION PROJECT

ENGINEERING SERVICES	AMOUNT
Reclamation Work Plan and Supporting Documents, Site Characterization, and Engineering Evaluation/Cost Analysis (completed by MSE-HKM, Inc.)	$86,454.00
Design Engineering and Bid Specification Preparation	$34,124.71
Construction Engineering	$35,837.15
Total Engineering Costs	**$156,415.86**

CONSTRUCTION SERVICES	AMOUNT
Environmental Reclamation Northwest, LLC. Contract	$204,579.00

PERCENTAGE ENGINEERING FEES TO CONSTRUCTION COST	
Planning-Characterization/Construction Cost	42.3%
Design Engineering/Construction Cost	16.7%
Construction Engineering/Construction Cost	17.5%
Total Engineering/Construction Cost	76.5%

APPENDIX H

CONSTRUCTION BID PACKAGE DRAWINGS

SHEET NO.	DESCRIPTION
1	COVER
2	LEGEND
3	GENERAL SITE MAP
4	ROAD IMPROVEMENT PLAN AND TYPICAL SECTION
5	STREAM DIVERSION LOCATION MAP
6	RUNON DITCH, BORROW, AND WET HANDLING AREAS
7	RUNON CONTROL DITCH DETAILS
8	TESTPIT AND MONITORING WELL LOCATIONS
9	TAILINGS REMOVAL PLAN MAP
10	TAILINGS REMOVAL SECTIONS (1 OF 2)
11	TAILINGS REMOVAL SECTIONS (2 OF 2)
12	REPOSITORY PLAN MAP
13	REPOSITORY CROSS SECTIONS
14	TAILINGS FINAL GRADE PLAN MAP
15	TAILINGS FINAL GRADE SECTIONS (1 OF 2)
16	TAILINGS FINAL GRADE SECTIONS (2 OF 2)
17	STREAM CHANNEL AND DROP STRUCTURE DETAILS
18	WASTE ROCK REMOVAL PLAN MAP (WR-1)
19	WASTE ROCK REMOVAL PLAN MAP (WR-2)
20	WASTE ROCK REMOVAL SECTIONS (WR-1)
21	WASTE ROCK REMOVAL SECTIONS (WR-2)
22	WASTE ROCK FINAL GRADE PLAN MAP (WR-1)
23	WASTE ROCK FINAL GRADE PLAN MAP (WR-2)
24	WASTE ROCK FINAL GRADE SECTIONS (WR-1)
25	WASTE ROCK FINAL GRADE SECTIONS (WR-2)
26	FENCING PLAN

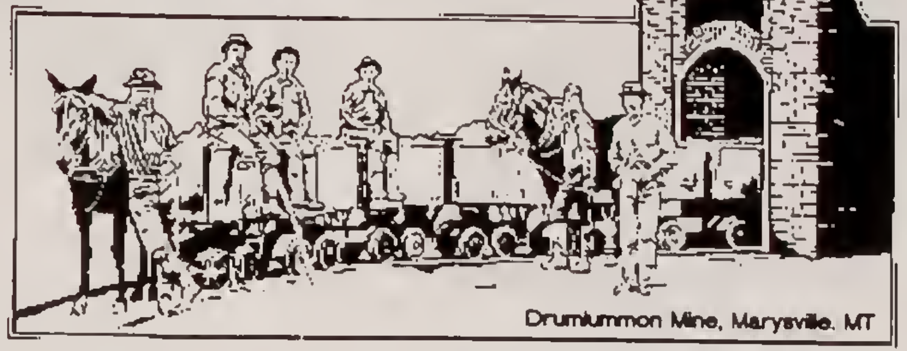
MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
MINE WASTE CLEANUP BUREAU

◆

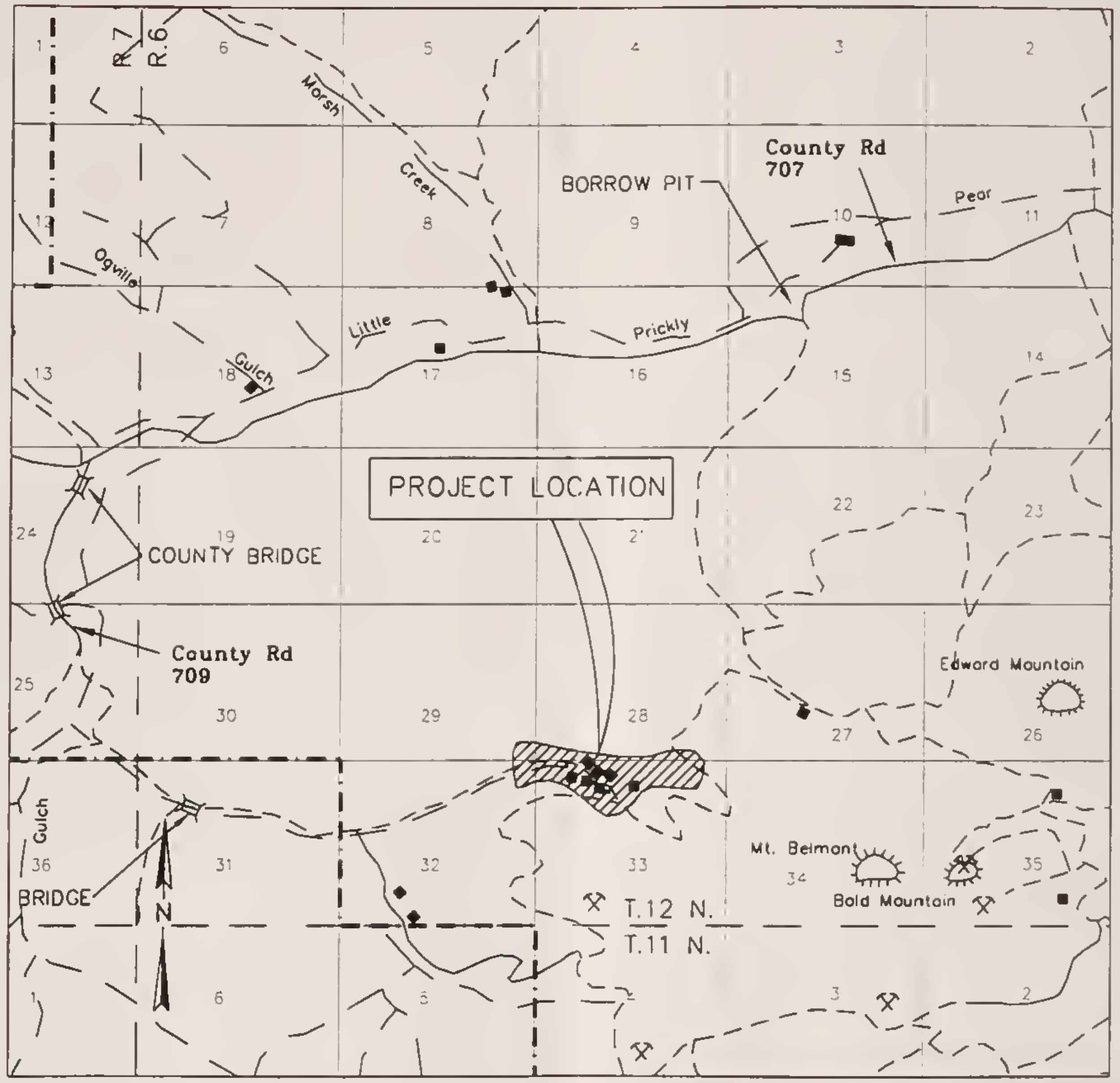
PLANS FOR PROPOSED EMPIRE MINE RECLAMATION PROJECT

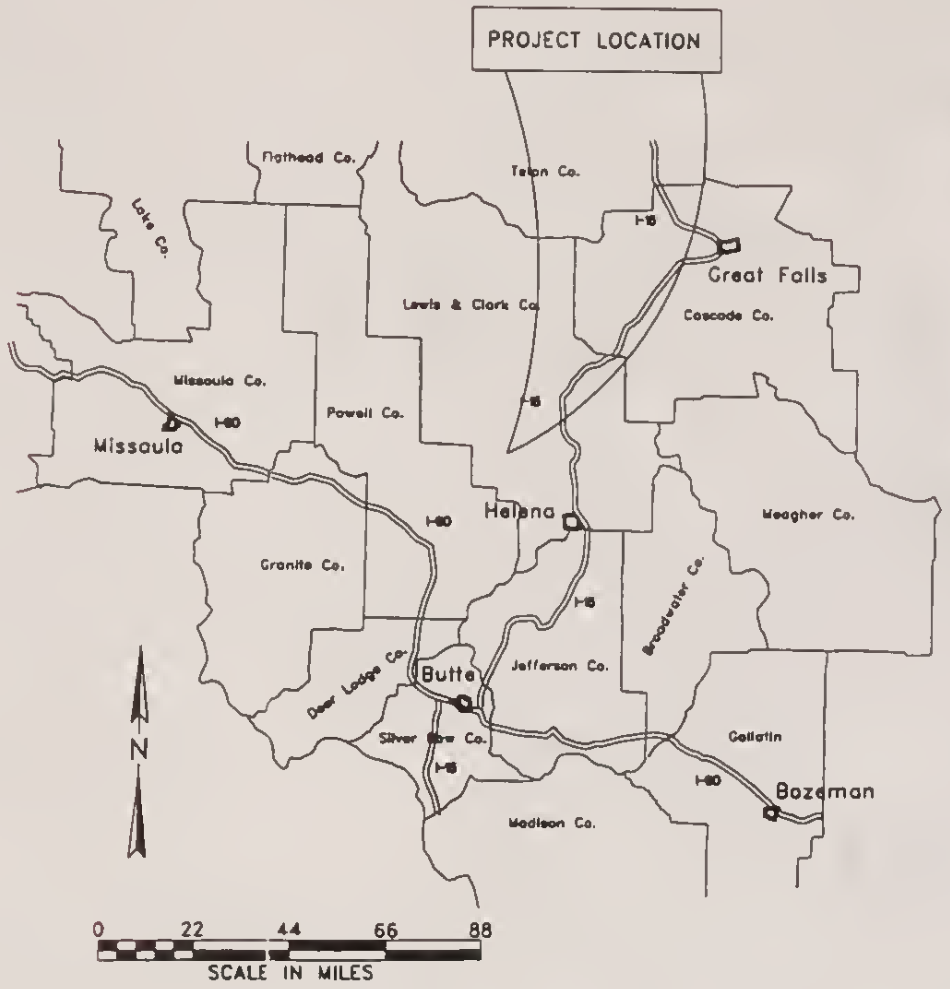
LEWIS AND CLARK COUNTY, MONTANA

MONTANA


Drumlummon Mine, Marysville, MT

MINE WASTE CLEANUP BUREAU





OLYMPUS
ENVIRONMENTAL, INC.

COVER	Design: DGW	Drawn: DGW		SHEET
EMPIRE MINE	Checked: CRS	Date: 6/25/97		1 OF 26
LEWIS AND CLARK COUNTY MONTANA	Approved: KSR	Revision	By	Date
	Job No: 7049-4			
	CAD File: index			
	Scale: AS SHOWN			

——5640——	CONTOUR LINE
– – – – – – – –	POST-RECLAMATION CONTOUR
—— · · · —— · · · ——	EXISTING STREAM
—— · —— · —— · ——	STREAM DIVERSION
— · — · — · · —	RUNON CONTROL DITCH
—x——x——x—	NEW FENCE
- - - - - - - - - - - -	EXISTING ROAD TO BE IMPROVED
═══════	EXISTING ROAD
3	NOTE
▨	BUILDING
▩	FOUNDATION
⊠	TELEPHONE PEDESTAL
CP 30 △	CONTROL POINTS
⅄	ADIT
■–■	CULVERT
■——	OVERHEAD POWERLINE AND POLE LOCATION

▨	TOPSOIL
▦	NATIVE MATERIAL/ COVER MATERIAL
░	TAILINGS/ WASTE ROCK
▩	RIPRAP

℄ = CENTER LINE
fmsl = FEET MEAN SEA LEVEL
REF = REFERENCE
SHT = SHEET
TYP = TYPICAL
TP = TAILINGS PILE
WR = WASTE ROCK PILE
⊕ TP-1 = TEST PIT LOCATION
◐ BP-4 = GEOTECHNICAL TEST PIT LOCATION
○ MW-1 = MONITORING WELL LOCATION

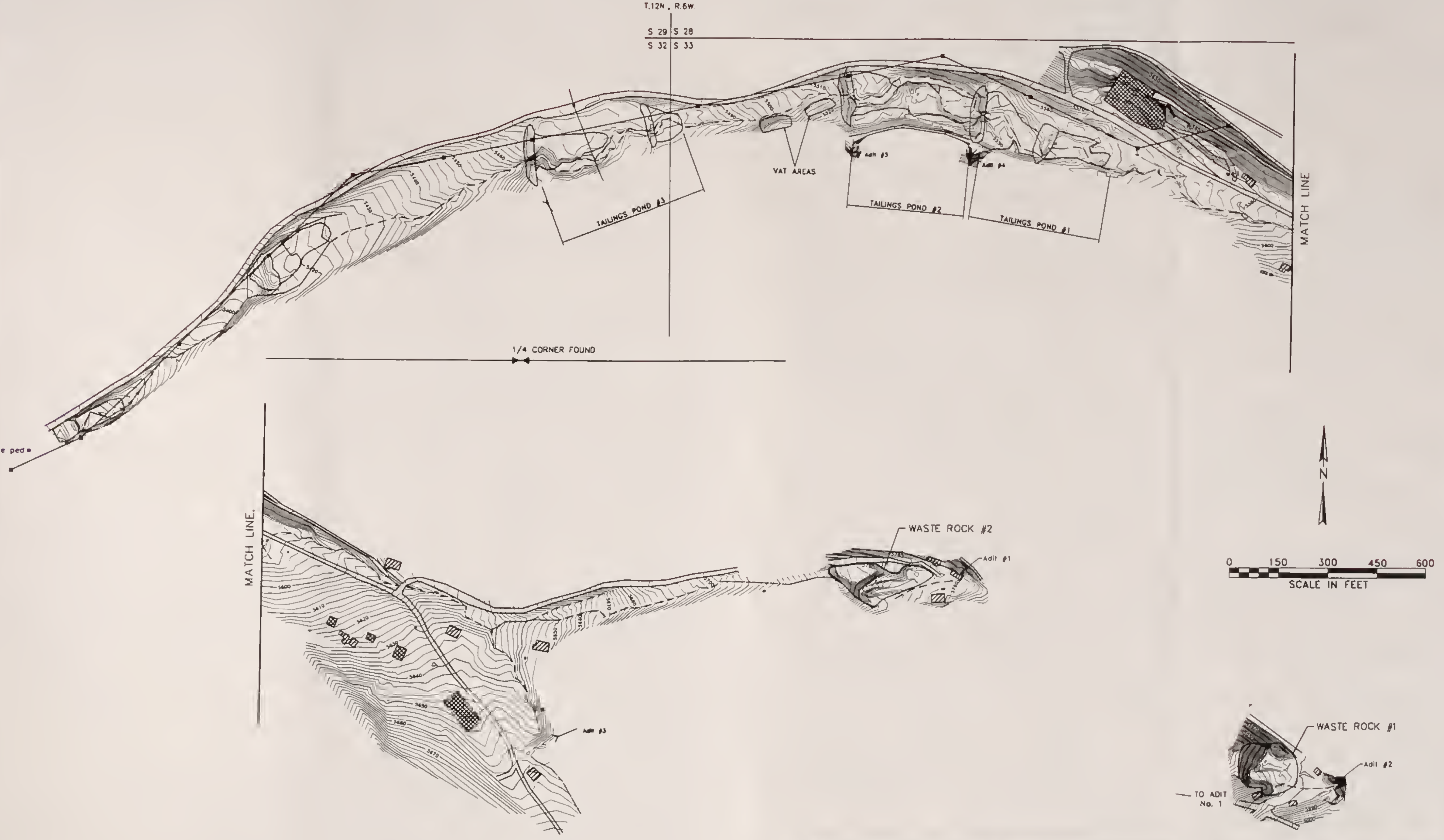
OLYMPUS
ENVIRONMENTAL, INC.

LEGEND

EMPIRE MINE

LEWIS AND CLARK COUNTY
MONTANA

Design: DGW	Drawn: DGW			SHEET	
Checked: CRS	Date: 7/21/97				
Approved: KSR	Revision	By	Date		
Job No: 7049-4				2 OF 26	
CAD File: legend					
Scale:					



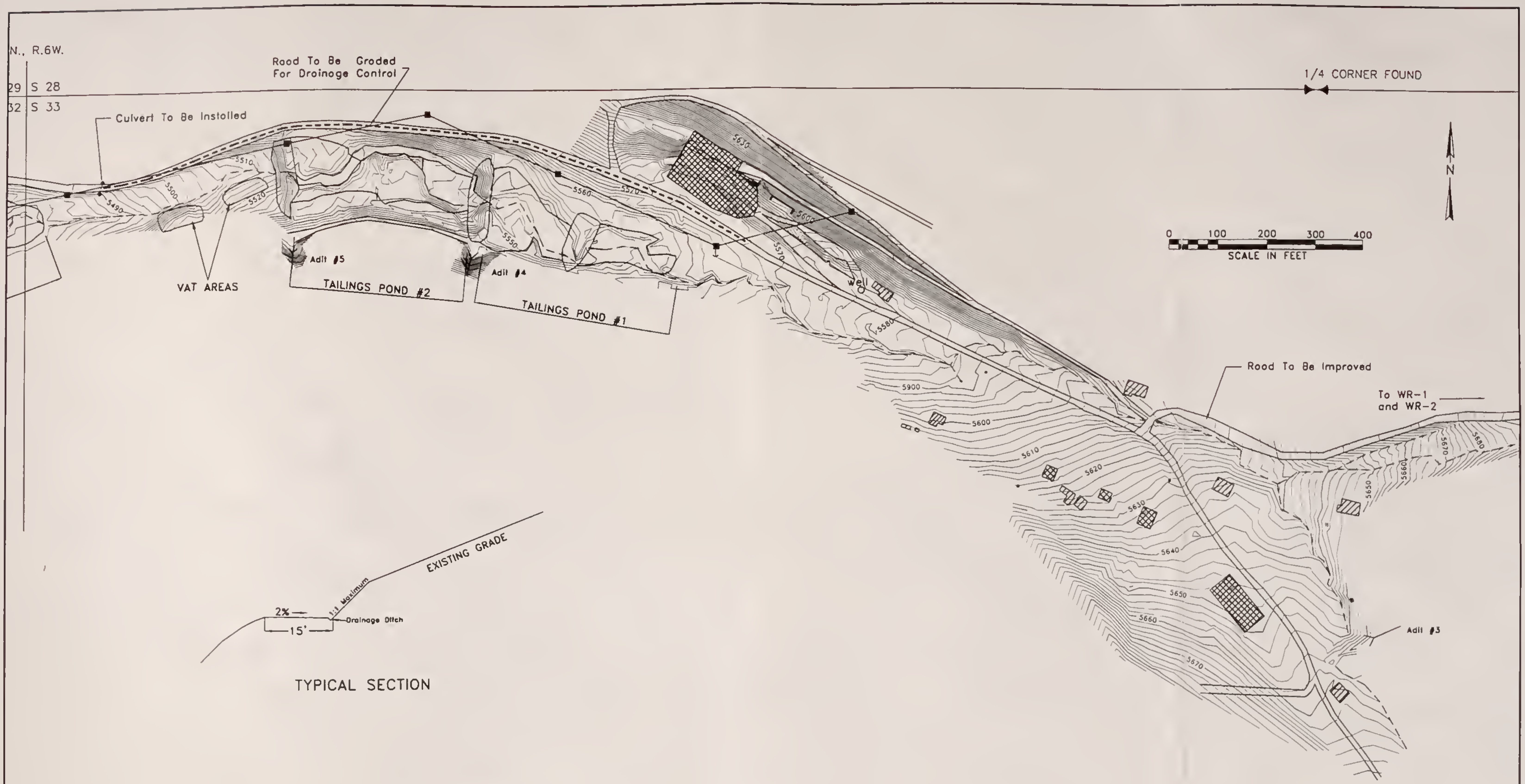
OLYMPUS ENVIRONMENTAL, INC.

GENERAL SITE MAP

EMPIRE MINE

LEWIS AND CLARK COUNTY
MONTANA

Design: DGW	Drawn: DGW			SHEET
Checked: CRS	Date: 7/2/97			
Approved: KSR	Revision	By	Date	3 of 26
Job No: 7049-4				
CAD File: site_map				
Scale: As Shown				



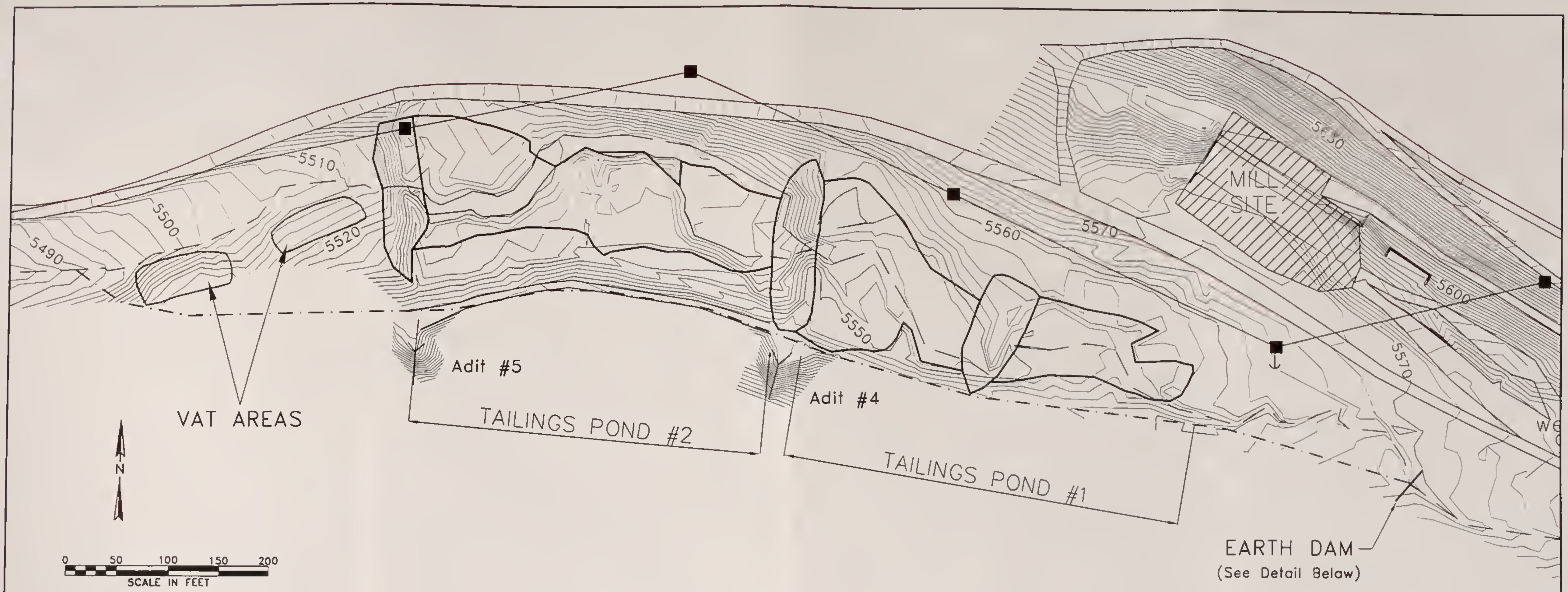
OLYMPUS
ENVIRONMENTAL, INC.

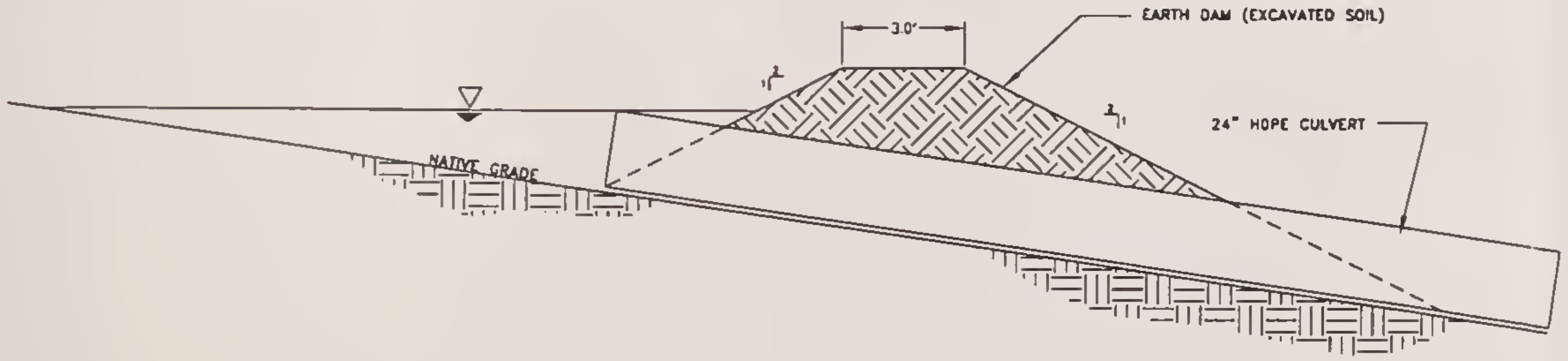
ROAD IMPROVEMENT PLAN
AND TYPICAL SECTION

EMPIRE MINE

LEWIS AND CLARK COUNTY
MONTANA

Design: DGW	Drawn: DGW			SHEET
Checked: CRS	Date: 7/19/97			
Approved: KSR	Revision	By	Date	4 OF 26
Job No: 7049-4				
CAD File: road				
Scale: As Shown				





EARTH DAM DETAILS

NOTES:

1. Designed for the 2-yr discharge (12 cfs)
2. The height of the earth dam was calculated to be 2 feet with an additional 1 foot of freeboard.
3. The culvert will be anchor in the runon control ditch.
4. A riprap outfall may need to be constructed where the diversion re-enters the stream.

OLYMPUS ENVIRONMENTAL, INC.

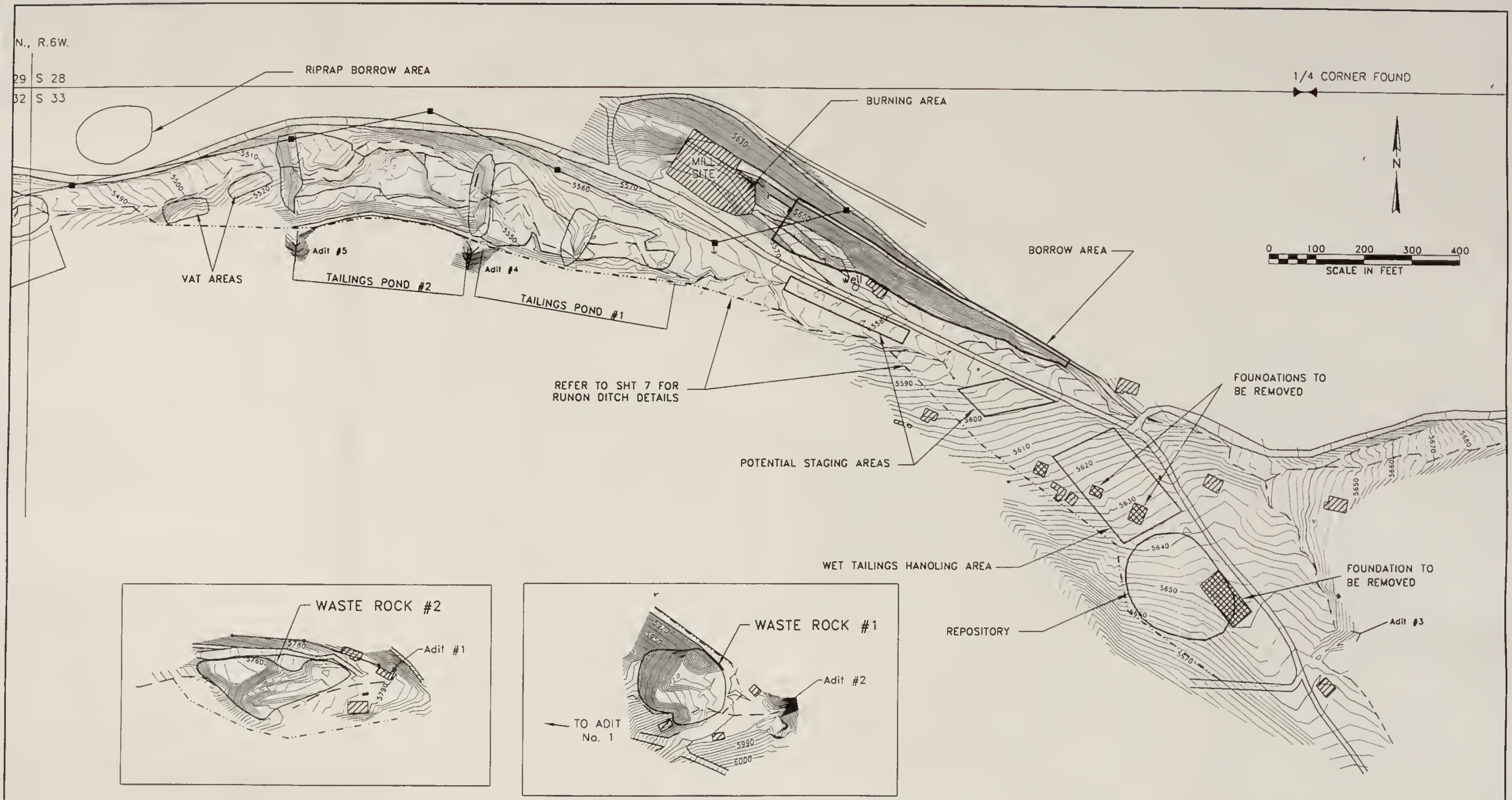
STREAM DIVERSION
LOCATION MAP
EMPIRE MINE
LEWIS AND CLARK COUNTY
MONTANA

Design: OGW
Checked: CRS
Approved: KSR
Job No: 7049-4
CAD File: diversion
Scale: As Shown

Drawn: OGW
Date: 7/7/97

Revision	By	Date

SHEET
5 OF 26



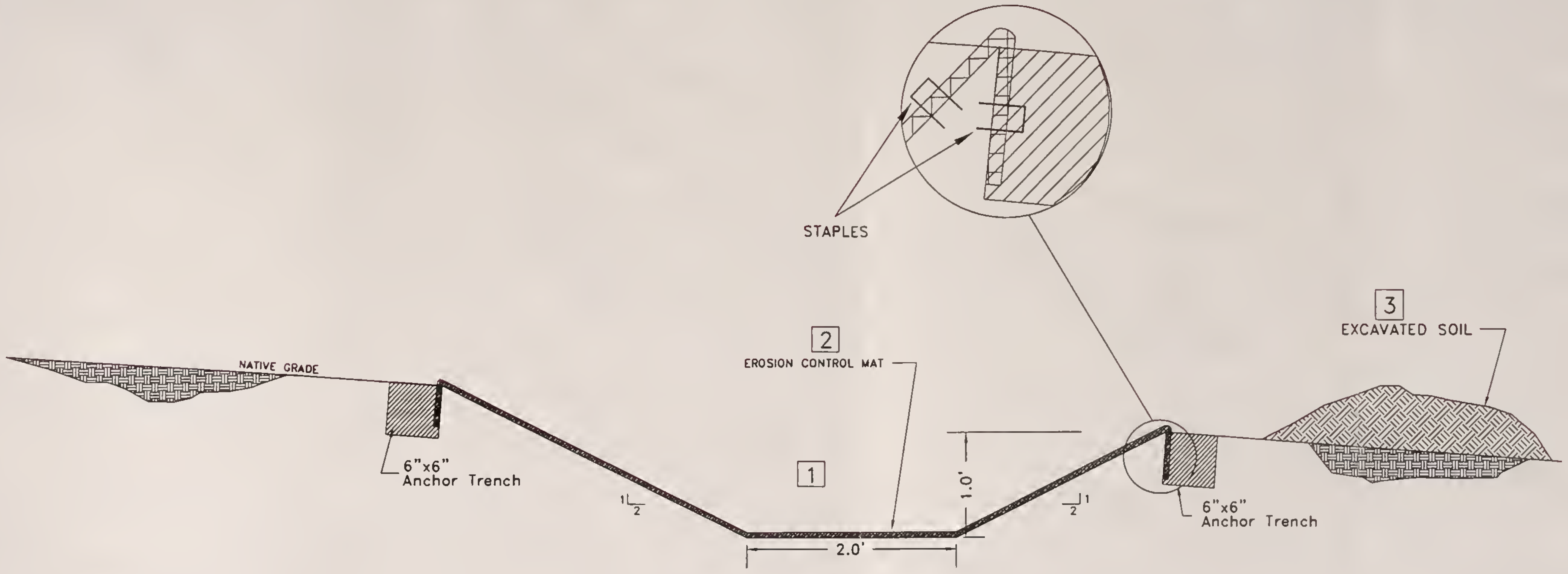
OLYMPUS ENVIRONMENTAL, INC.

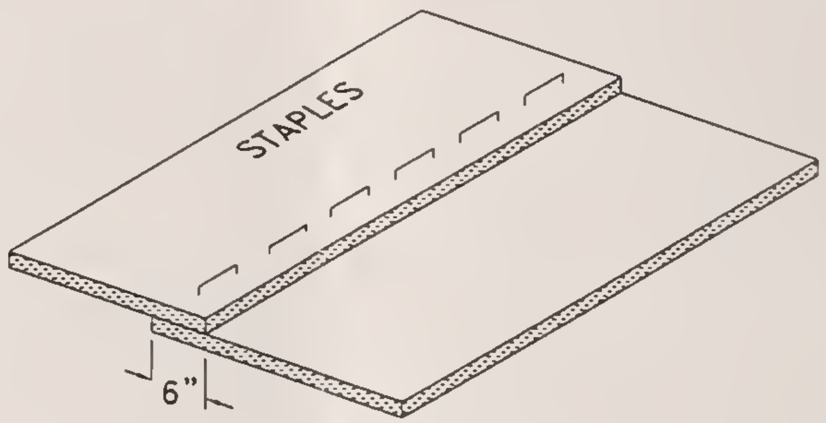
RUNON CONTROL DITCH, BORROW AREA, AND WET HANDLING AREA MAP

EMPIRE MINE

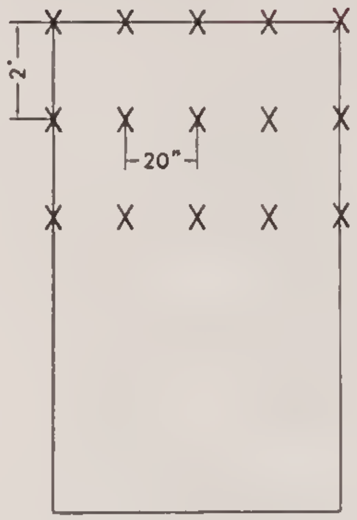
LEWIS AND CLARK COUNTY
MONTANA

Design: DGW	Drawn: DGW			SHEET
Checked: CRS	Date: 7/7/97			
Approved: KSR	Revision	By	Date	
Job No: 7049-4				6 OF 26
CAD File: runon				
Scale: As Shown				





SINGLE STYLE
OVERLAP DETAIL



STAPLE PATTERN DETAIL
3.5 STAPLES PER SQUARE YARD

NOTES

1. FERTILIZE, SEED, AND MULCH IN ACCORDANCE WITH THE SPECIAL PROVISIONS, ALL AREAS DISTURBED BY DIVERSION CONSTRUCTION.
2. INSTALL EROSION CONTROL MAT ALONG BOTTOM OF DIVERSION IN ACCORDANCE WITH SPECIAL PROVISIONS AND DETAILS ON THIS SHEET. ANCHOR MAT ON ALL SIDES IN ACCORDANCE WITH DETAILS ON THIS SHEET. ROLL MAT PARALLEL TO WATER FLOW DIRECTION.
3. USE SOIL EXCAVATED TO FORM DIVERSIONS FOR COVER SOIL IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
4. REFER TO SHT 6 FOR PLAN MAP OF RUNON DIVERSION DITCH LOCATIONS.

DRAWING NOT TO SCALE

OLYMPUS
ENVIRONMENTAL, INC.

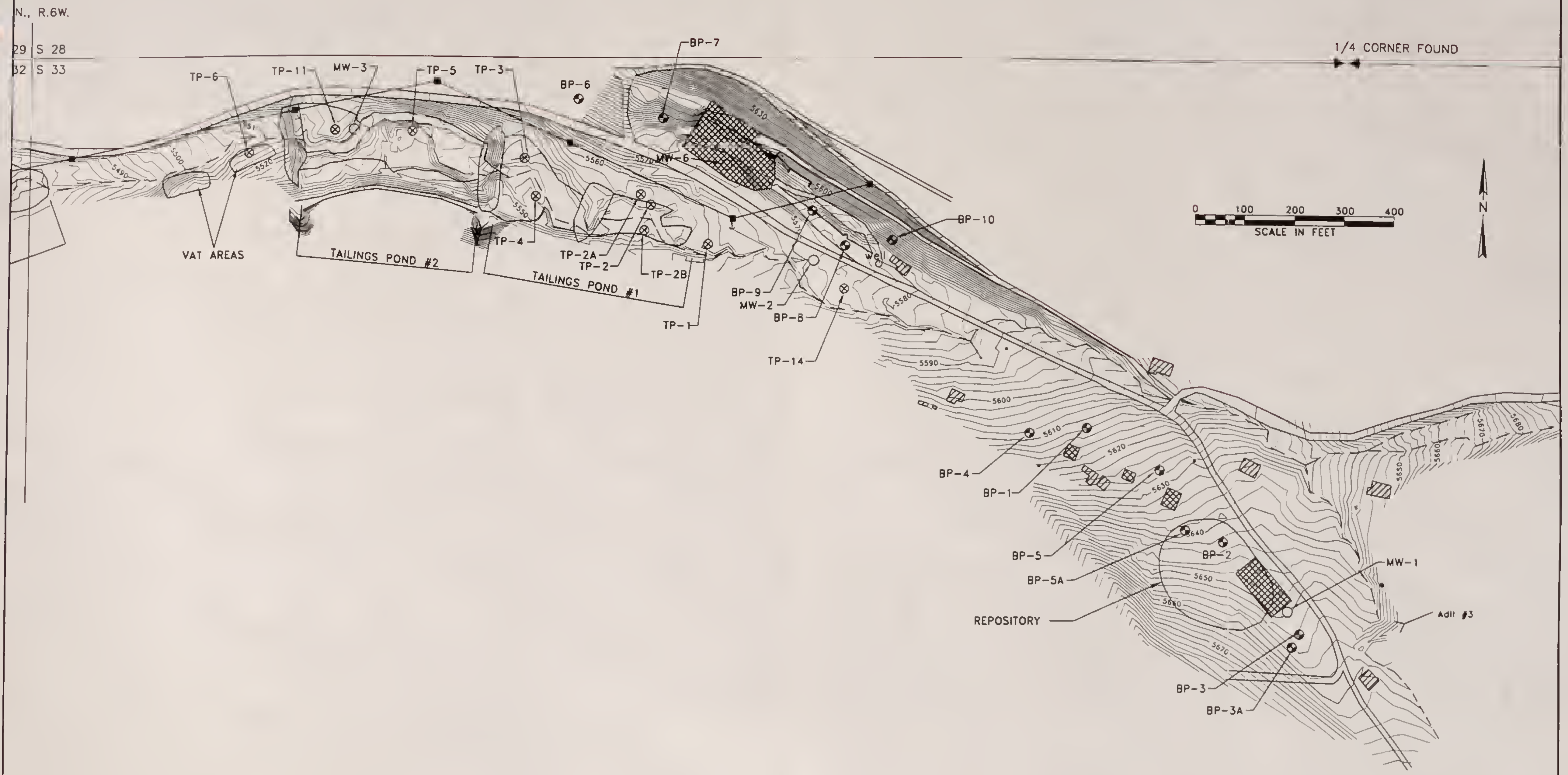
RUNON CONTROL
DITCH DETAILS
EMPIRE MINE
LEWIS AND CLARK COUNTY
MONTANA

Design: DGW
Checked: CRS
Approved: KSR
Job No: 7049-4
CAD File: run_detail
Scale:

Drawn: DGW
Date: 7/10/97

Revision	By	Date

SHEET
7 OF 26



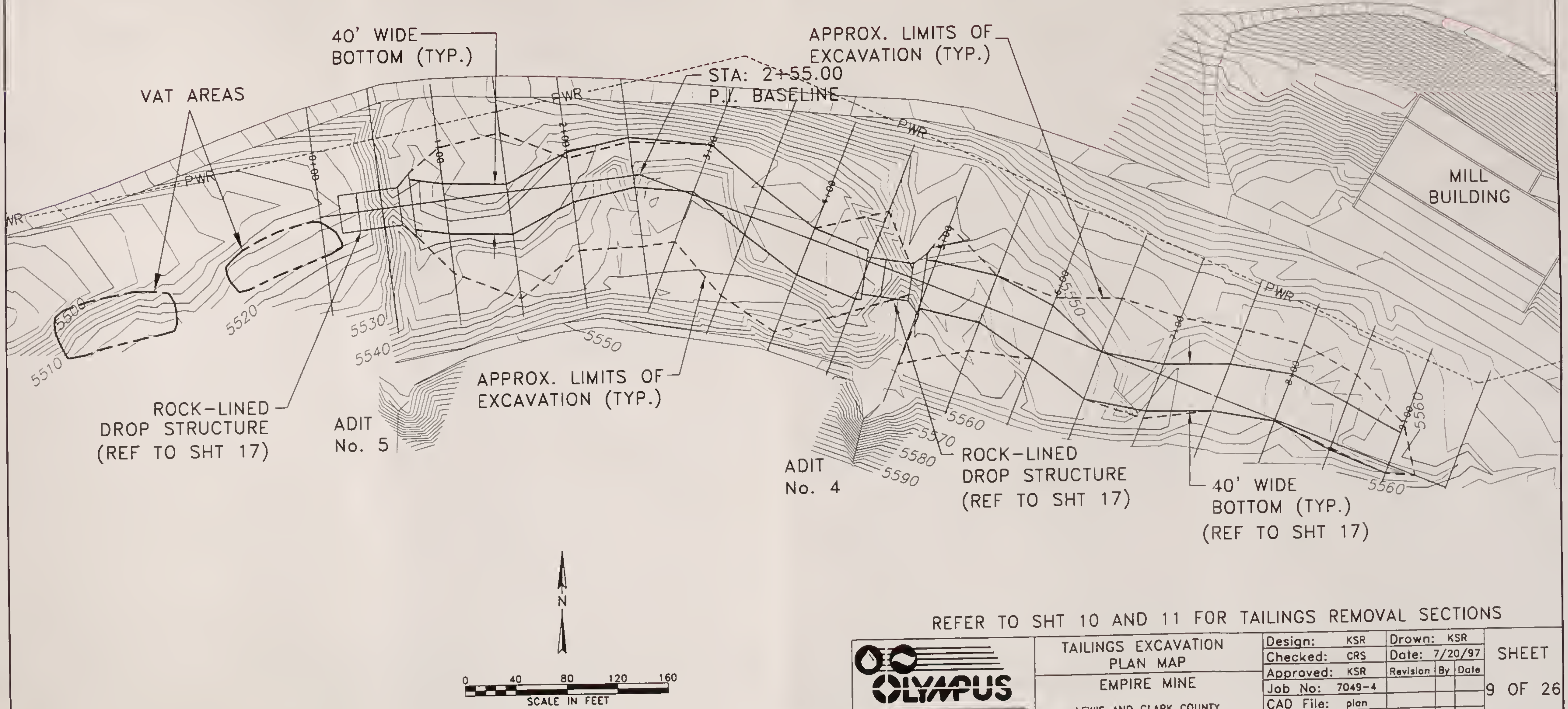
OLYMPUS ENVIRONMENTAL, INC.

TESTPIT AND MONITORING WELL LOCATION MAP

EMPIRE MINE

LEWIS AND CLARK COUNTY
MONTANA

Design: OGW	Drawn: OGW		SHEET
Checked: CRS	Date: 7/7/97		
Approved: KSR	Revision	By	Date
Job No: 7049-4			8 OF 26
CAD File: testpit			
Scale: As Shown			


40' WIDE BOTTOM (TYP.)
VAT AREAS
STA: 2+55.00 P.I. BASELINE
APPROX. LIMITS OF EXCAVATION (TYP.)
MILL BUILDING
PWR
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
5500
5510
5520
5530
5540
5550
5560
5570
5580
5590
ROCK-LINED DROP STRUCTURE (REF TO SHT 17)
ADIT No. 5
APPROX. LIMITS OF EXCAVATION (TYP.)
ADIT No. 4
ROCK-LINED DROP STRUCTURE (REF TO SHT 17)
40' WIDE BOTTOM (TYP.) (REF TO SHT 17)
N
0
40
80
120
160
SCALE IN FEET

REFER TO SHT 10 AND 11 FOR TAILINGS REMOVAL SECTIONS

OLYMPUS ENVIRONMENTAL, INC.

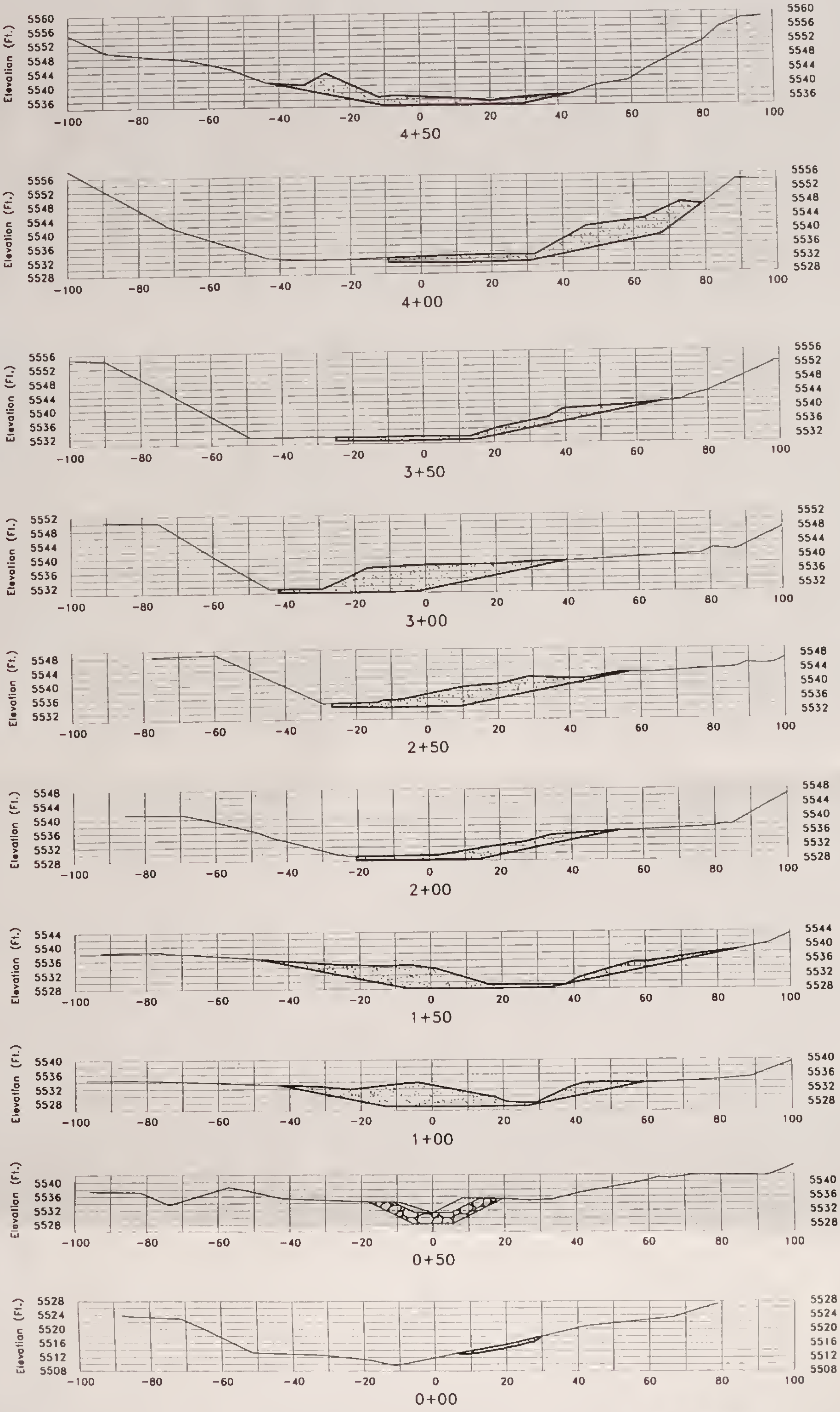
TAILINGS EXCAVATION
PLAN MAP
EMPIRE MINE
LEWIS AND CLARK COUNTY
MONTANA

Design: KSR
Checked: CRS
Approved: KSR
Job No: 7049-4
CAD File: plan
Scale: As Shown

Drawn: KSR
Date: 7/20/97

Revision	By	Date

SHEET
9 OF 26



LEGEND

▨ TAILINGS REMOVAL

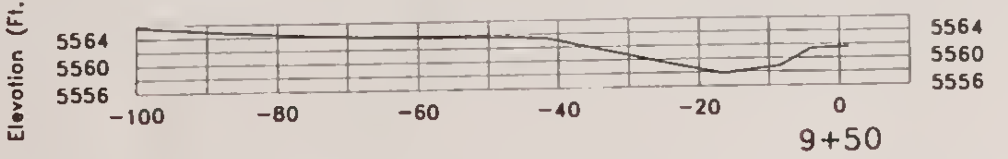
Note: Sections Looking Upstream
Refer to SHT 9 for Section Locations

0 15 30 45 60
SCALE IN FEET

OLYMPUS
ENVIRONMENTAL, INC.

TAILINGS REMOVAL
SECTIONS (1 OF 2)
EMPIRE MINE
LEWIS AND CLARK COUNTY
MONTANA

Design: KSR	Drawn: KSR			SHEET
Checked: CRS	Date: 7/21/97			
Approved: KSR	Revision	By	Date	10 OF 26
Job No: 7049-4				
CAD File: tail_sec_4				
Scale: As Shown				



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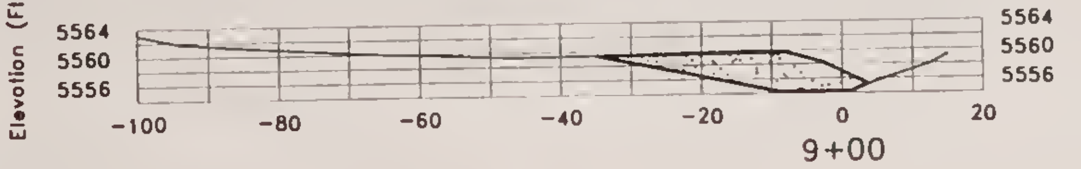

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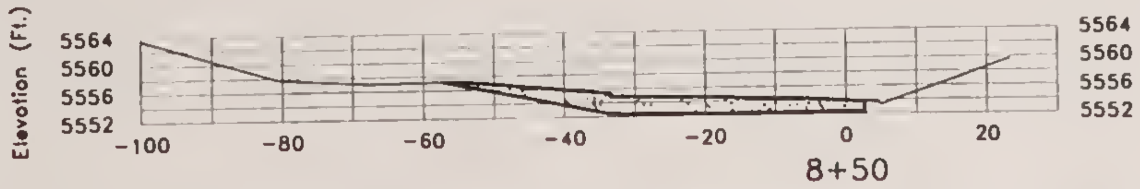

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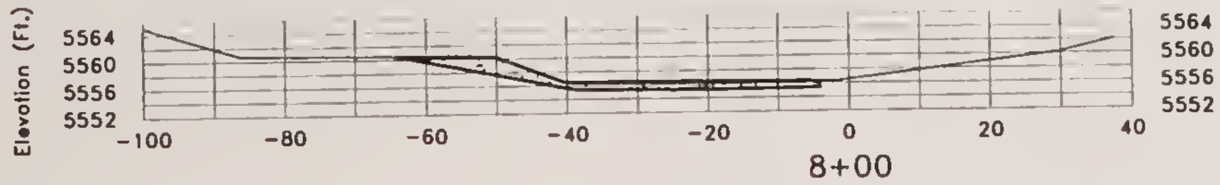

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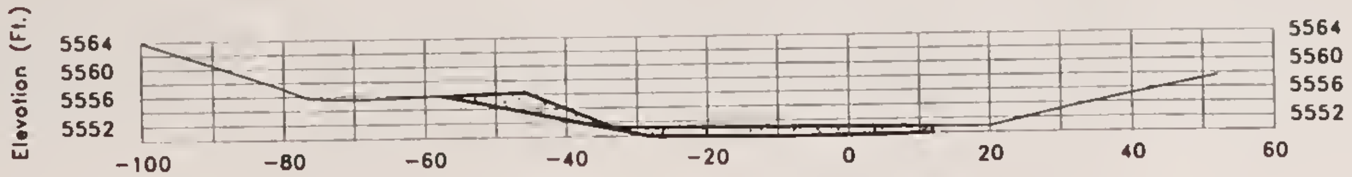

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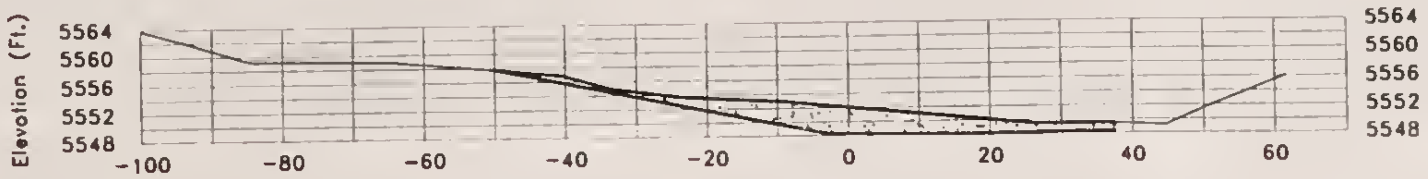

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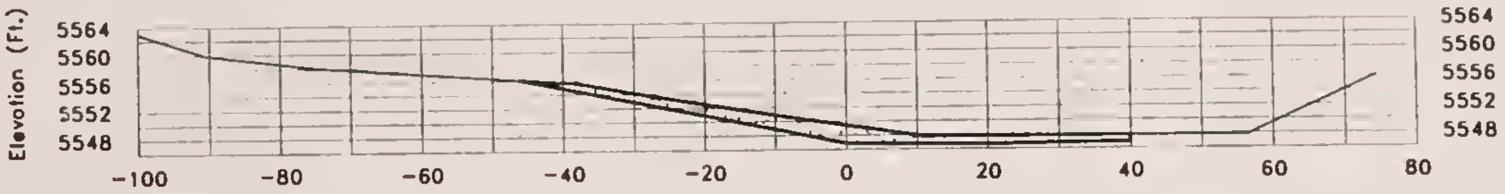

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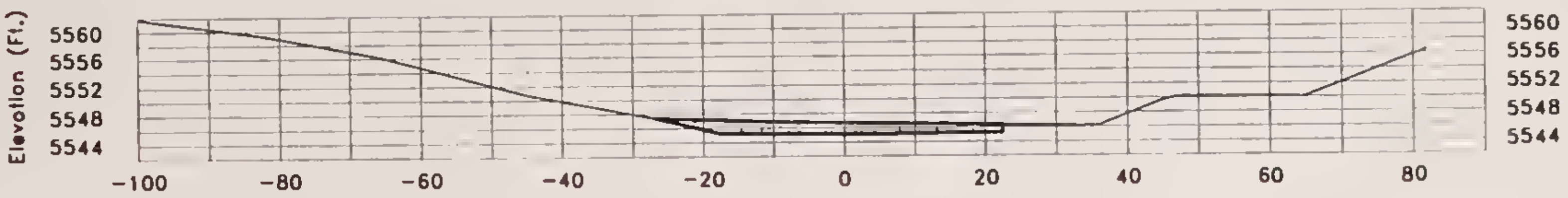

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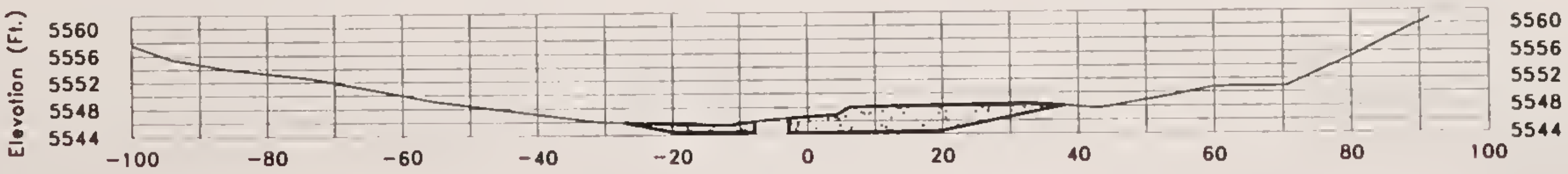

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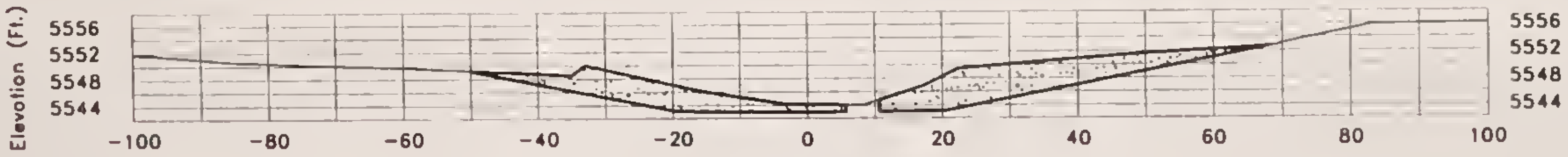

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LEGEND

▨ TAILINGS REMOVAL

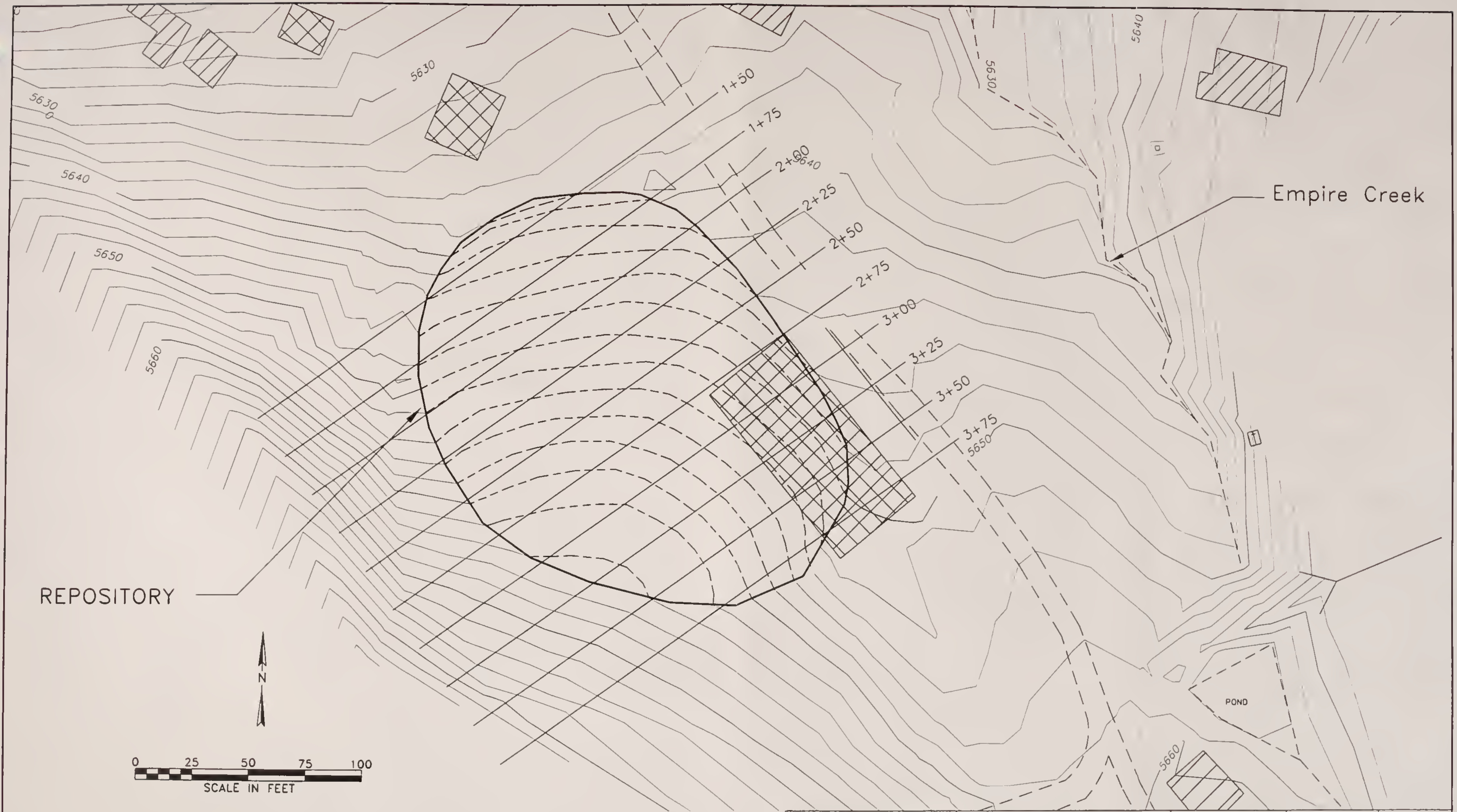
Note: Sections Looking Upstream
Refer to SHT 9 for Section Locations

0 15 30 45 60
SCALE IN FEET

OLYMPUS
ENVIRONMENTAL, INC.

TAILINGS REMOVAL
SECTIONS (2 OF 2)
EMPIRE MINE
LEWIS AND CLARK COUNTY
MONTANA

Design: KSR	Drawn: KSR			SHEET
Checked: CRS	Date: 7/21/97			
Approved: KSR	Revision	By	Date	
Job No: 7049-4				11 OF 26
CAD File: tail_sec_4				
Scale: As Shown				



OLYMPUS
ENVIRONMENTAL, INC.

REPOSITORY PLAN MAP

EMPIRE MINE

LEWIS AND CLARK COUNTY
MONTANA

Design: DGW	Drawn: DGW				SHEET
Checked: CRS	Date: 7/9/97				
Approved: KSR	Revision	By	Date		
Job No: 7049-4					12 OF 26
CAD File: repos1bs					
Scale: As Shown					

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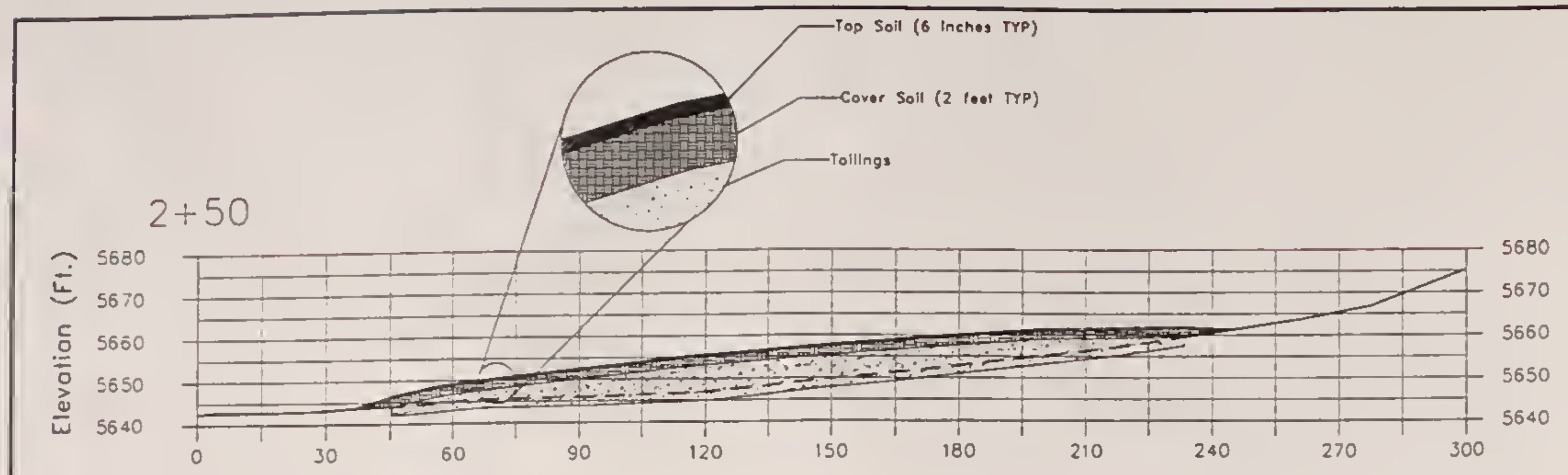

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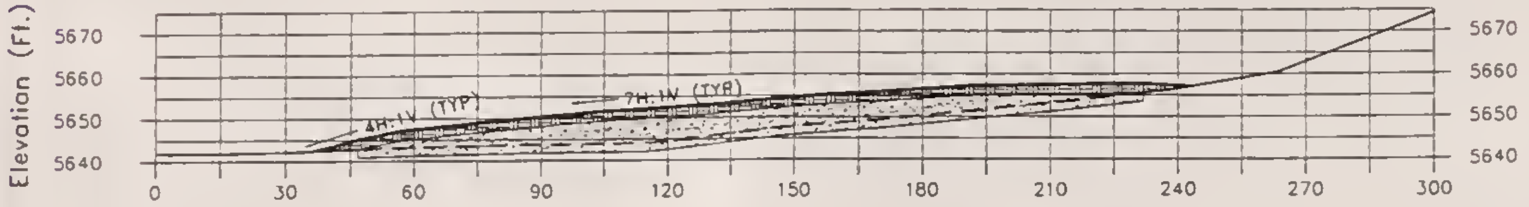

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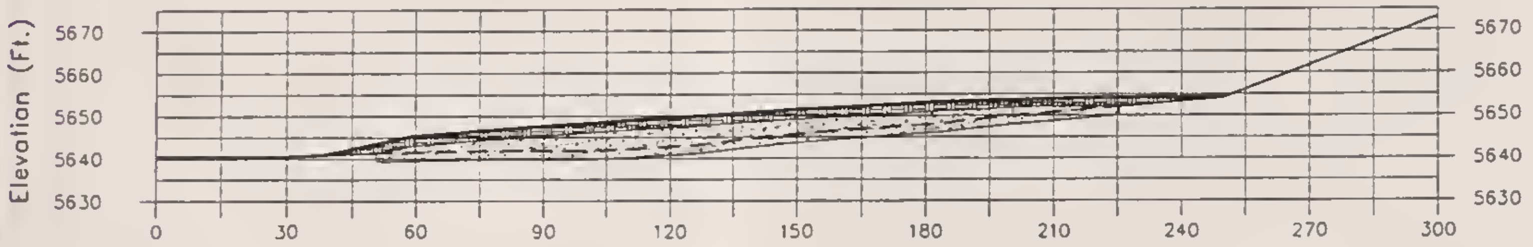

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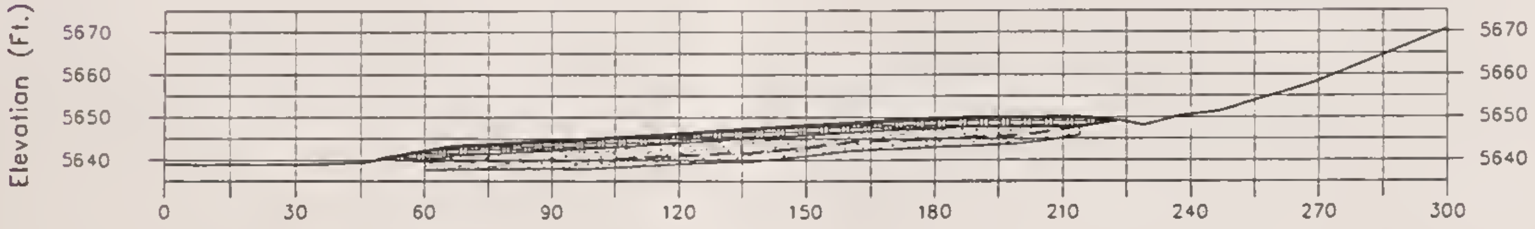

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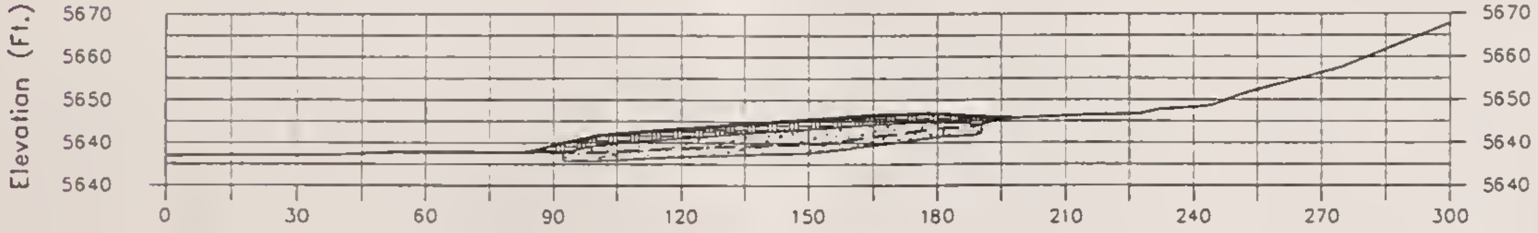

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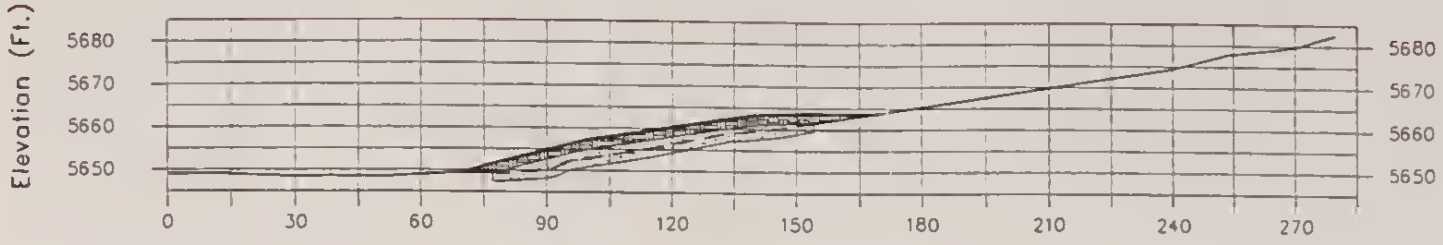

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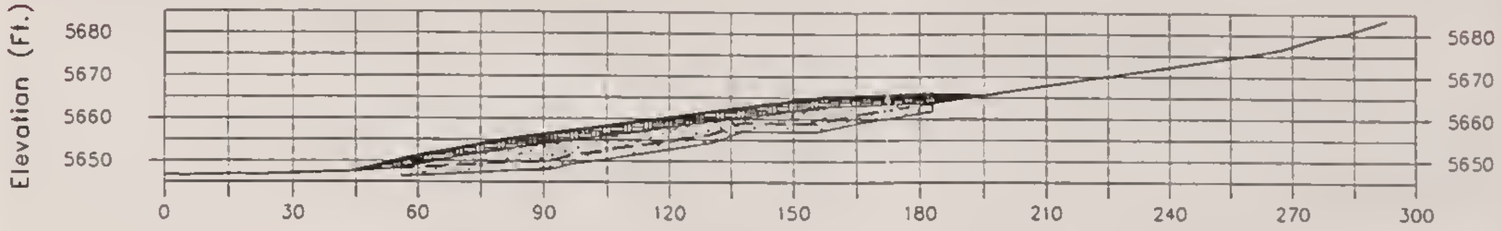

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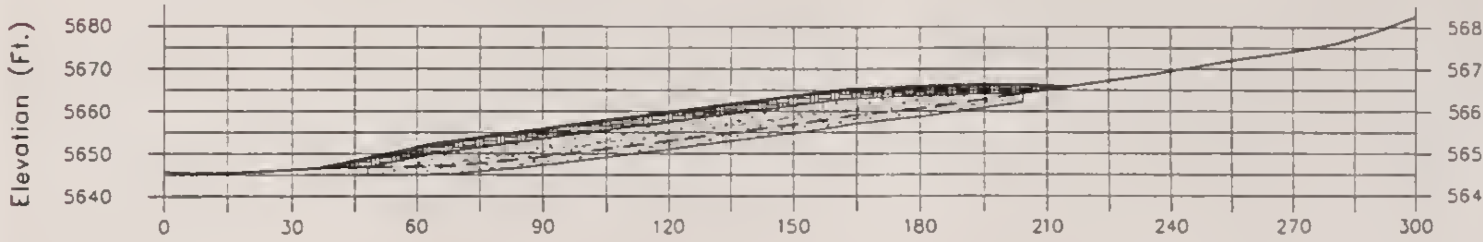

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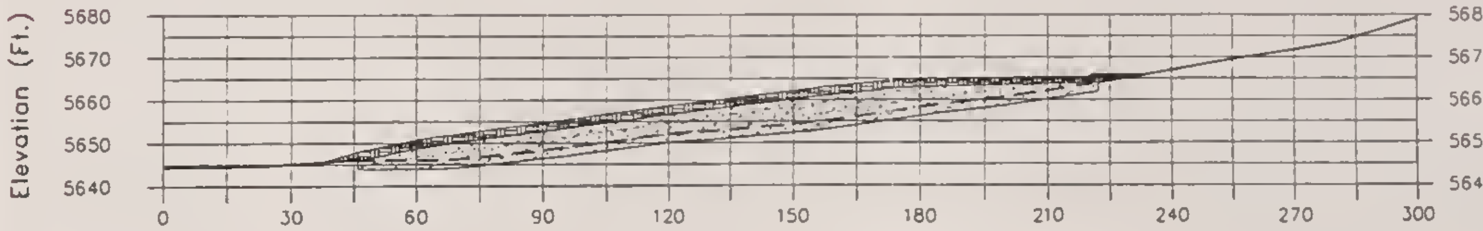

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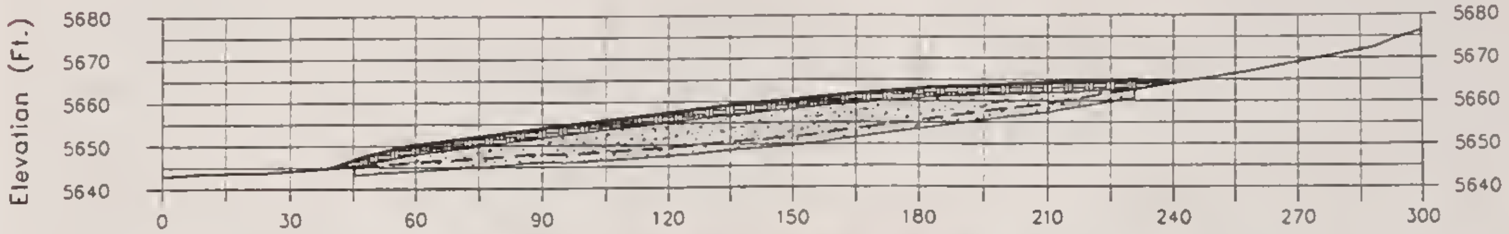
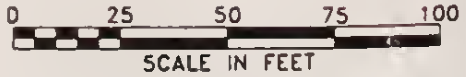


Note: Section Looking Southeast
Refer to SHT 12 for Section Locations



OLYMPUS
ENVIRONMENTAL, INC.

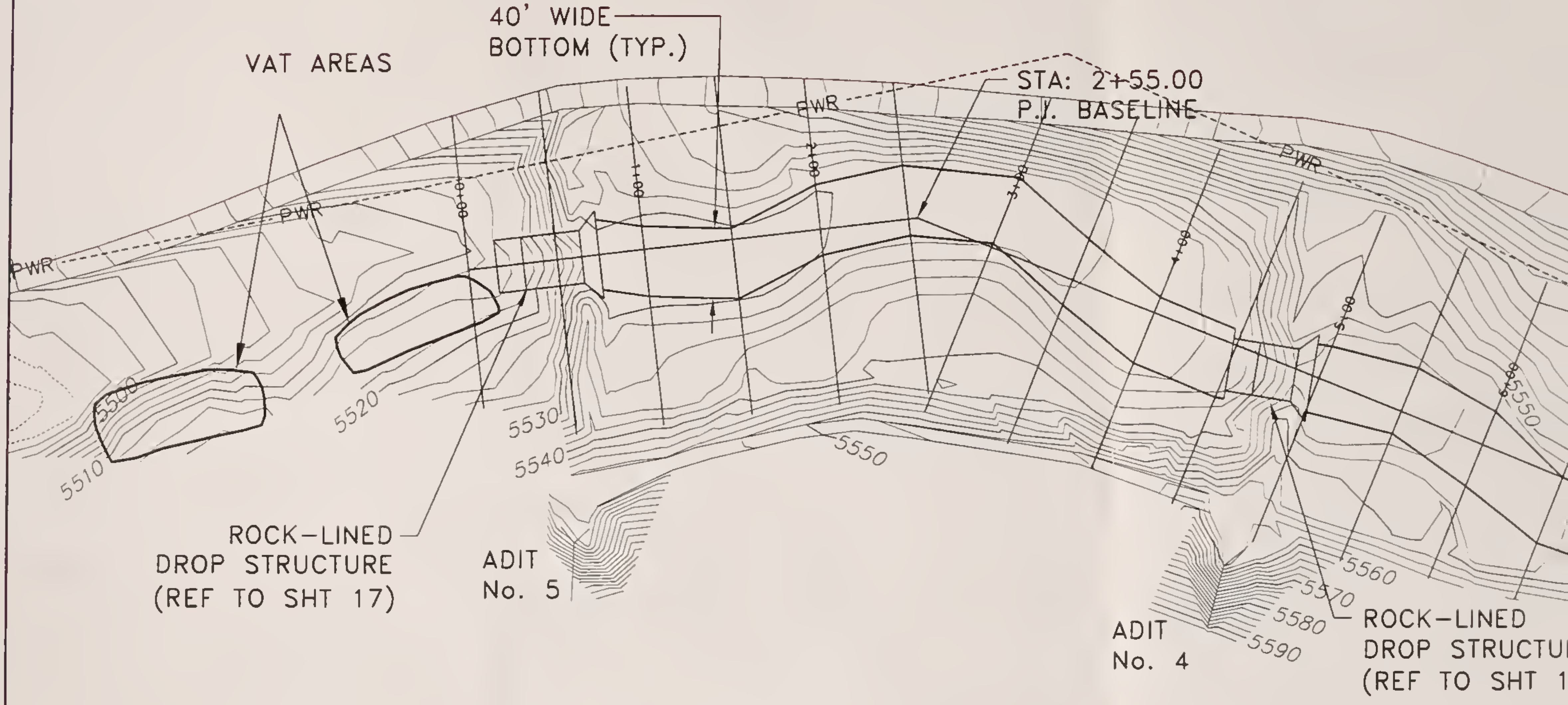
REPOSITORY CROSS SECTIONS
EMPIRE MINE
LEWIS AND CLARK COUNTY
MONTANA

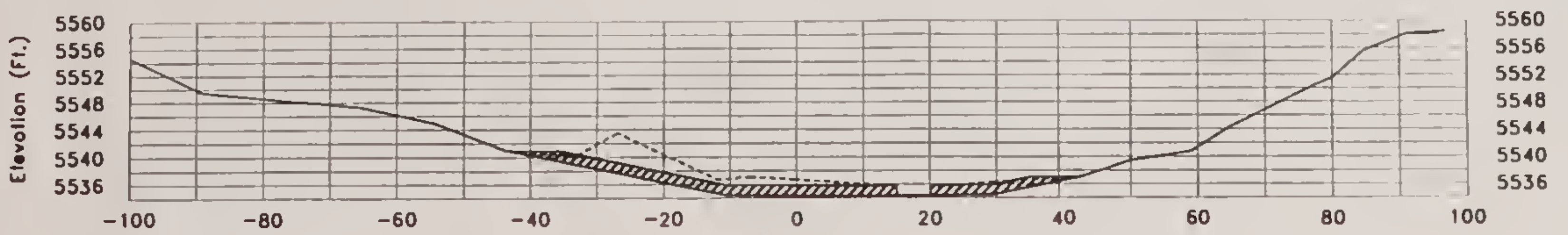
Design: DGW
Checked: CRS
Approved: KSR
Job No: 7049-4
CAD File: repos_sect
Scale: As Shown

Drawn: DGW
Date: 7/9/97

Revision	By	Date

SHEET
13 OF 26


VAT AREAS
40' WIDE BOTTOM (TYP.)
STA: 2+55.00
P.I. BASELINE
PWR
PWR
PWR
PWR
0+00
1+00
2+00
3+00
4+00
5+00
6+00
5500
5510
5520
5530
5540
5550
5550
5560
5570
5580
5590
ROCK-LINED
DROP STRUCTURE
(REF TO SHT 17)
ADIT
No. 5
ADIT
No. 4
ROCK-LINED
DROP STRUCTU
(REF TO SHT 1



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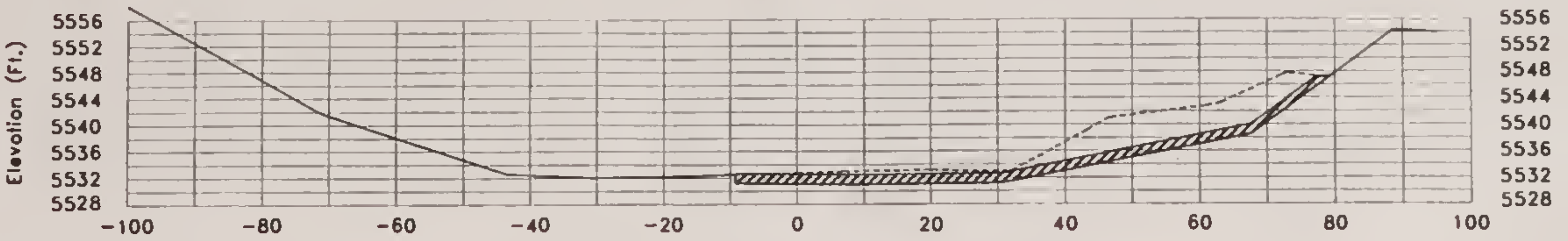

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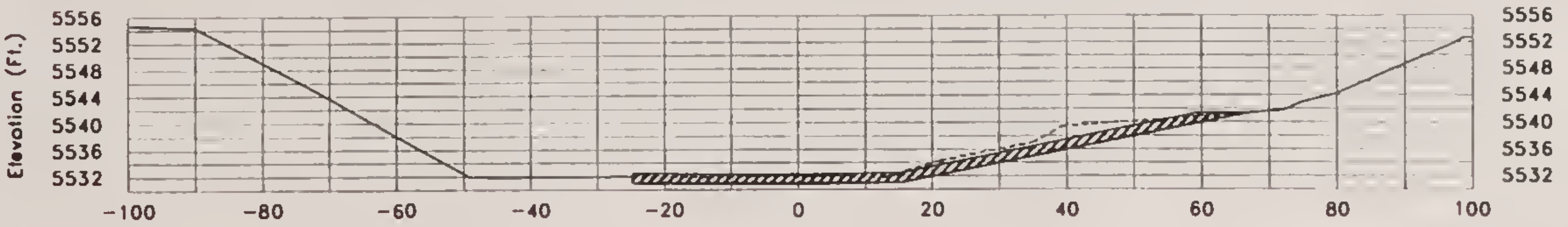

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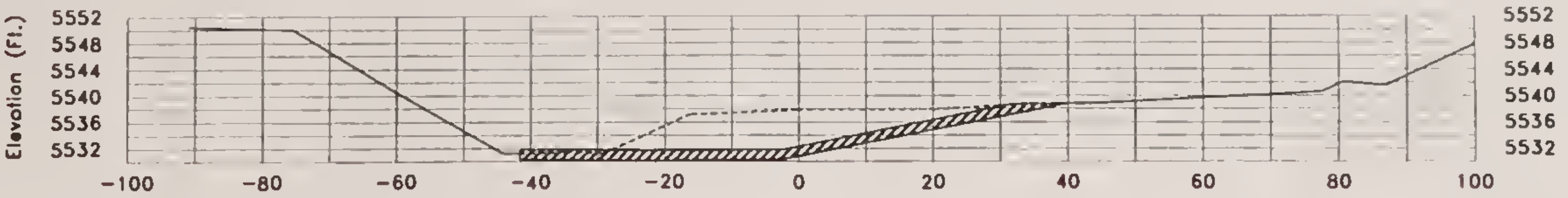

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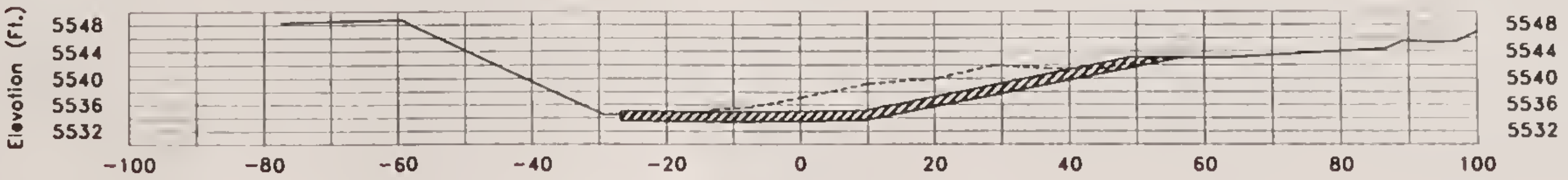

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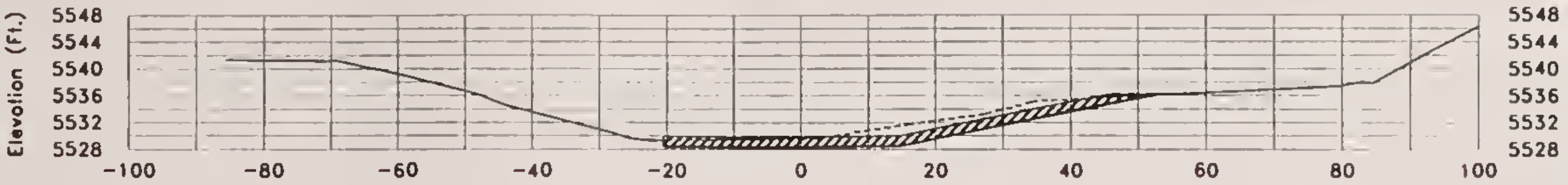

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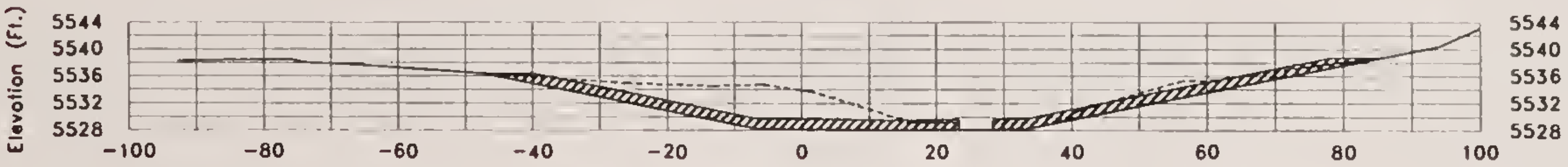

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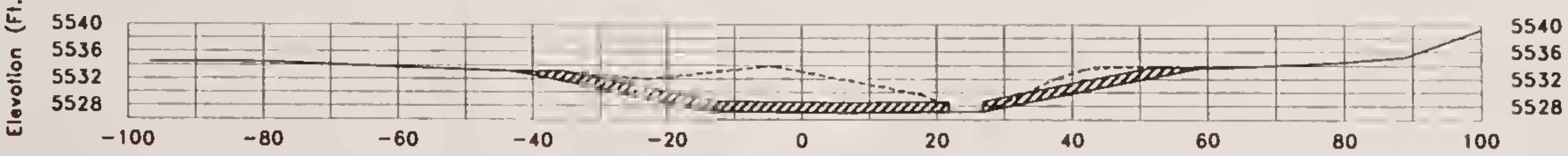

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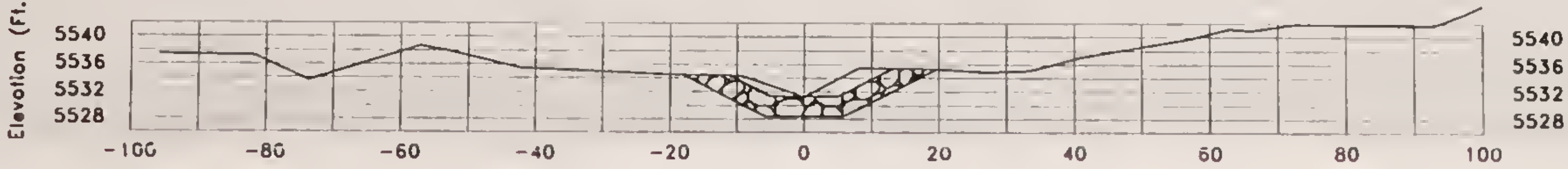

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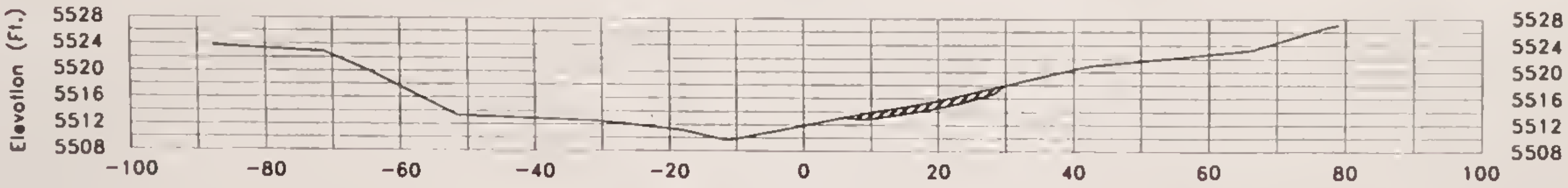

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LEGEND

▨ COVER SOIL BACKFILL
(18 INCHES TYP)

- - - - PRE-RECLAMATION
TAILINGS SURFACE

Note: Sections Looking Upstream
Refer to SHT 14 for Section Locations

0 15 30 45 60
SCALE IN FEET

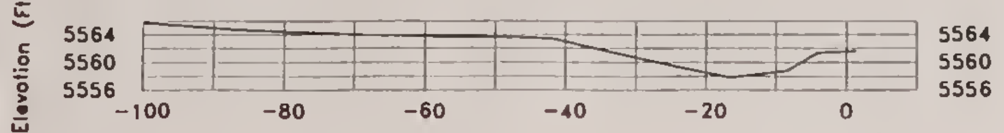
OLYMPUS
ENVIRONMENTAL, INC.

TAILINGS FINAL GRADE
SECTIONS (1 OF 2)

EMPIRE MINE

LEWIS AND CLARK COUNTY
MONTANA

Design: KSR	Drawn: KSR			SHEET
Checked: CRS	Date: 7/21/97			
Approved: KSR	Revision	By	Date	
Job No: 7049-4				15 OF 26
CAD File:tail_sec_4				
Scale: As Shown				



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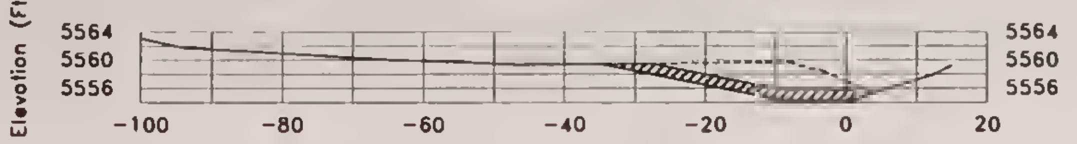

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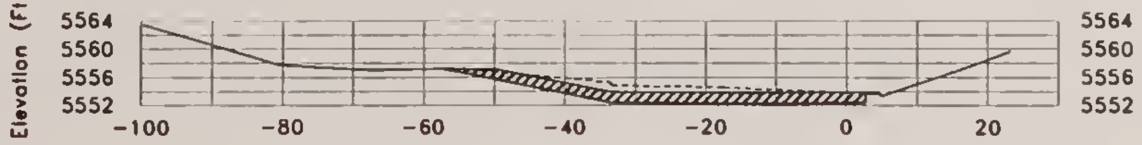

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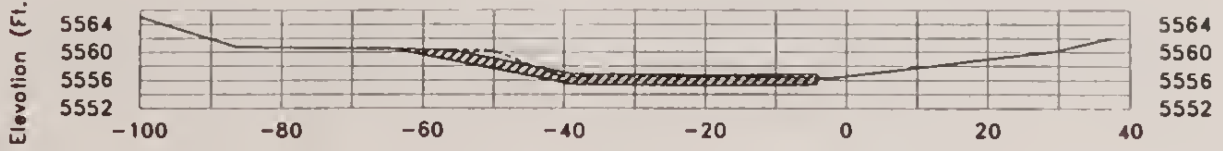

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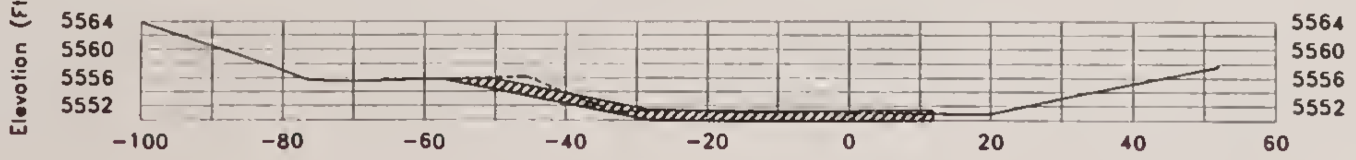

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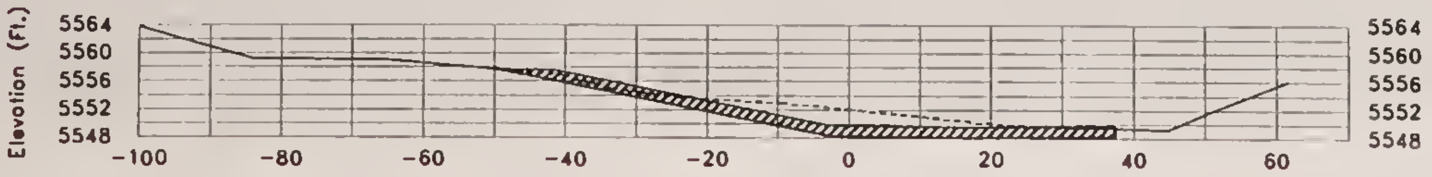

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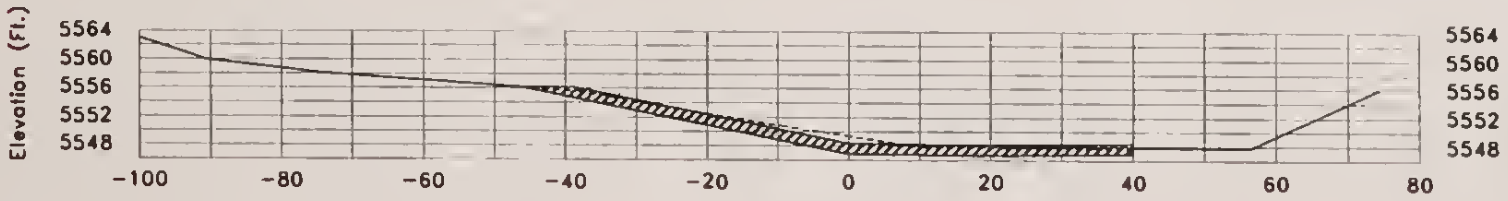

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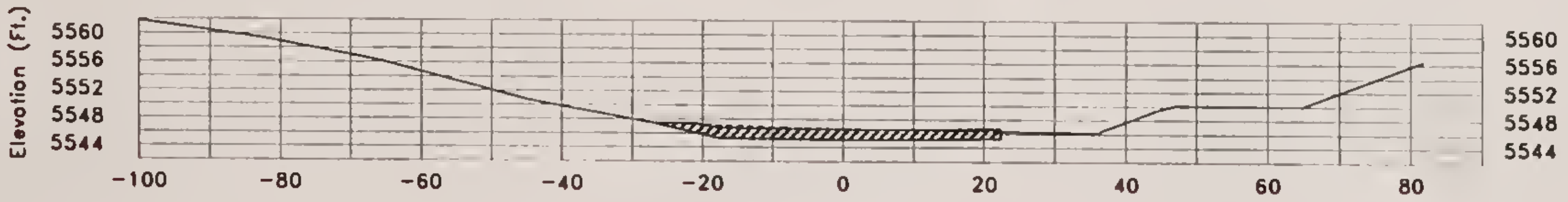

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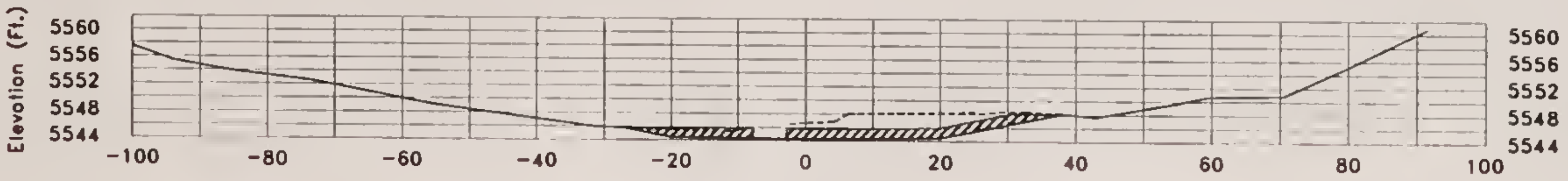

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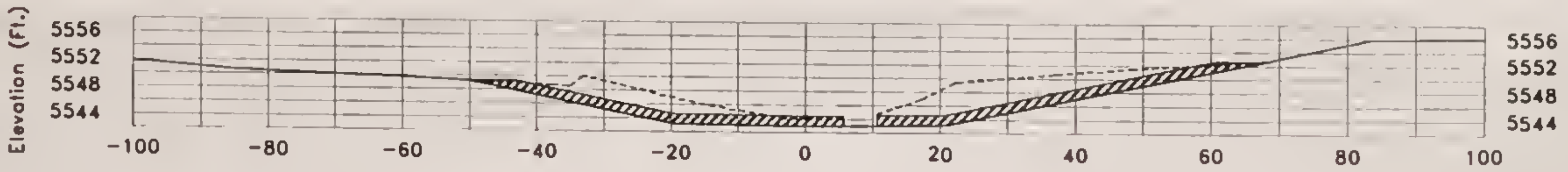

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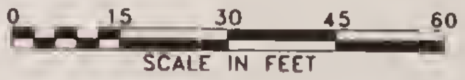
LEGEND

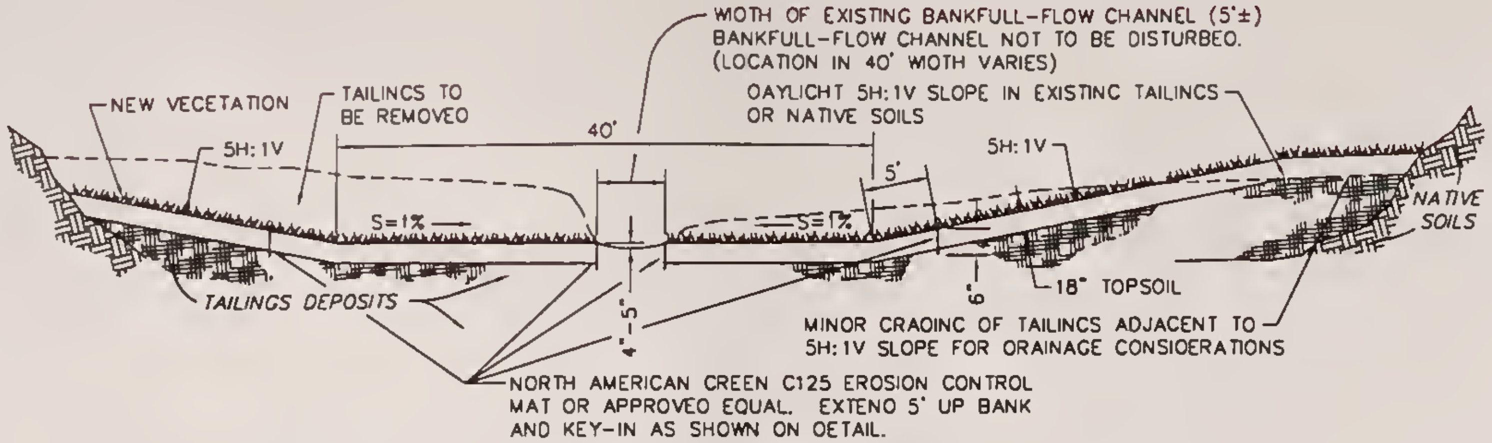
▨ COVER SOIL BACKFILL (18 INCHES TYP)

┄┄┄ PRE-RECLAMATION TAILINGS SURFACE

Note: Sections Looking Upstream
Refer to SHT 14 for Section Locations

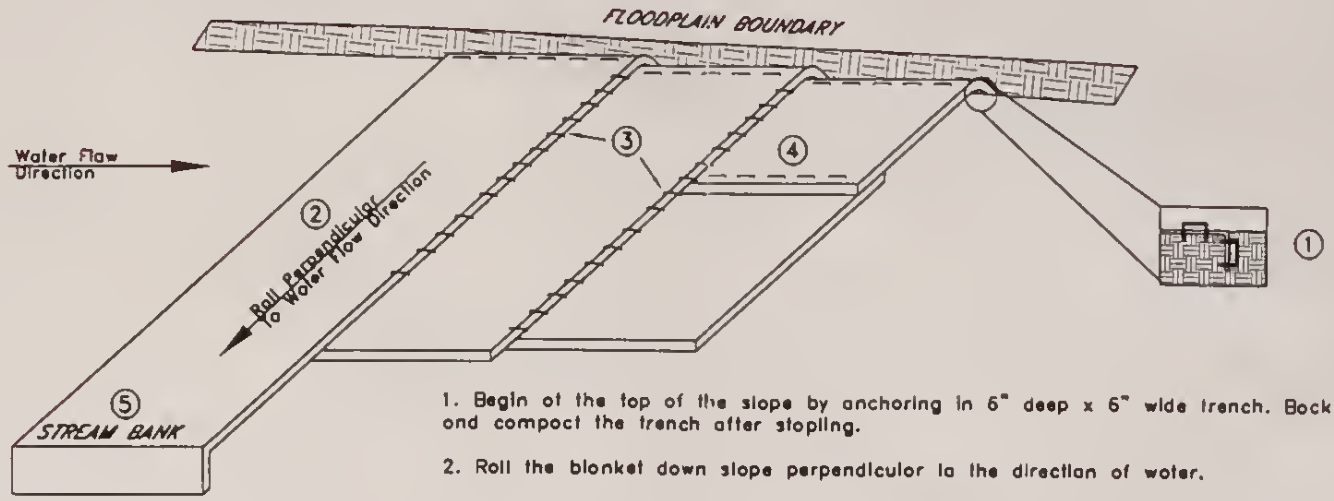


OLYMPUS ENVIRONMENTAL, INC.	TAILINGS FINAL GRADE SECTIONS (2 OF 2)	Design: KSR	Drawn: KSR			SHEET
		Checked: CRS	Date: 7/21/97			
	EMPIRE MINE	Approved: KSR	Revision	By	Date	
		Job No: 7049-4				16 OF 26
	LEWIS AND CLARK COUNTY MONTANA	CAD File:tail_sec_4				
		Scale: As Shown				


WIDTH OF EXISTING BANKFULL-FLOW CHANNEL (5'±) BANKFULL-FLOW CHANNEL NOT TO BE DISTURBED. (LOCATION IN 40' WIDTH VARIES)
NEW VEGETATION
TAILINGS TO BE REMOVED
DAYLIGHT 5H:1V SLOPE IN EXISTING TAILINGS OR NATIVE SOILS
40'
5H:1V
5'
5H:1V
S=1%
S=1%
NATIVE SOILS
TAILINGS DEPOSITS
6"
18" TOPSOIL
4"-5"
MINOR GRADING OF TAILINGS ADJACENT TO 5H:1V SLOPE FOR DRAINAGE CONSIDERATIONS
NORTH AMERICAN GREEN C125 EROSION CONTROL MAT OR APPROVED EQUAL. EXTEND 5' UP BANK AND KEY-IN AS SHOWN ON DETAIL.

TYPICAL SECTION THROUGH TAILINGS PONDS

NO SCALE



1. Begin at the top of the slope by anchoring in 6" deep x 6" wide trench. Backfill and compact the trench after stapling.

2. Roll the blanket down slope perpendicular to the direction of water.

3. The edges of parallel blankets must be stapled with approximately 2" overlap.

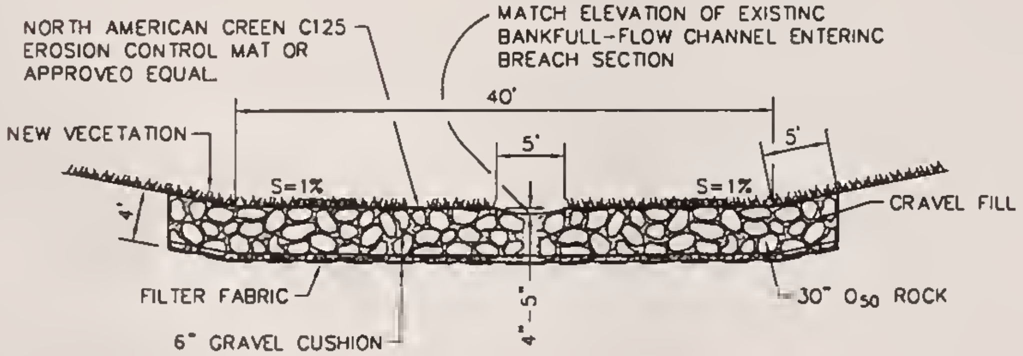
4. When blankets must be spliced down the slope, place blankets end over (shingle style) with approximately 4" overlap. Staple through overlapped area, approximately 12" apart.

5. Anchor the blanket at the stream end in a 18" deep x 6" wide trench. Backfill and compact the trench after stapling.

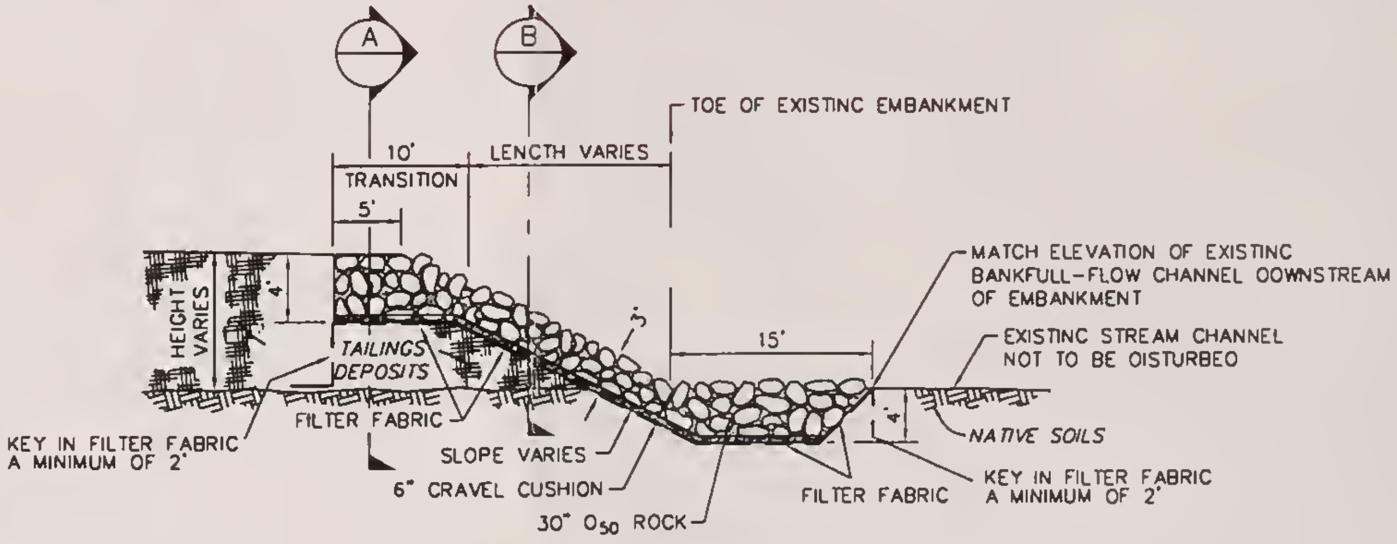
6. Refer to SHT 7 for general staple pattern.

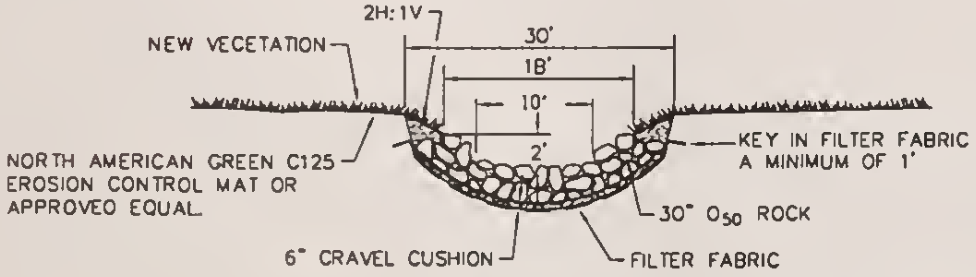
TYPICAL EROSION MAT DETAIL

NO SCALE


NORTH AMERICAN GREEN C125 EROSION CONTROL MAT OR APPROVED EQUAL
MATCH ELEVATION OF EXISTING BANKFULL-FLOW CHANNEL ENTERING BREACH SECTION
40'
NEW VEGETATION
5'
5'
S=1%
S=1%
4'
GRAVEL FILL
FILTER FABRIC
30" D_{50} ROCK
6" GRAVEL CUSHION
4"-5"

SECTION A


A
B
TOE OF EXISTING EMBANKMENT
10'
TRANSITION
LENGTH VARIES
5'
HEIGHT VARIES
4'
TAILINGS DEPOSITS
3'
15'
MATCH ELEVATION OF EXISTING BANKFULL-FLOW CHANNEL DOWNSTREAM OF EMBANKMENT
EXISTING STREAM CHANNEL NOT TO BE DISTURBED
4'
NATIVE SOILS
KEY IN FILTER FABRIC A MINIMUM OF 2'
FILTER FABRIC
SLOPE VARIES
6" GRAVEL CUSHION
30" D_{50} ROCK
FILTER FABRIC
KEY IN FILTER FABRIC A MINIMUM OF 2'


2H:1V
30'
18'
10'
2'
NEW VEGETATION
NORTH AMERICAN GREEN C125 EROSION CONTROL MAT OR APPROVED EQUAL
KEY IN FILTER FABRIC A MINIMUM OF 1'
30" D_{50} ROCK
6" GRAVEL CUSHION
FILTER FABRIC

SECTION B

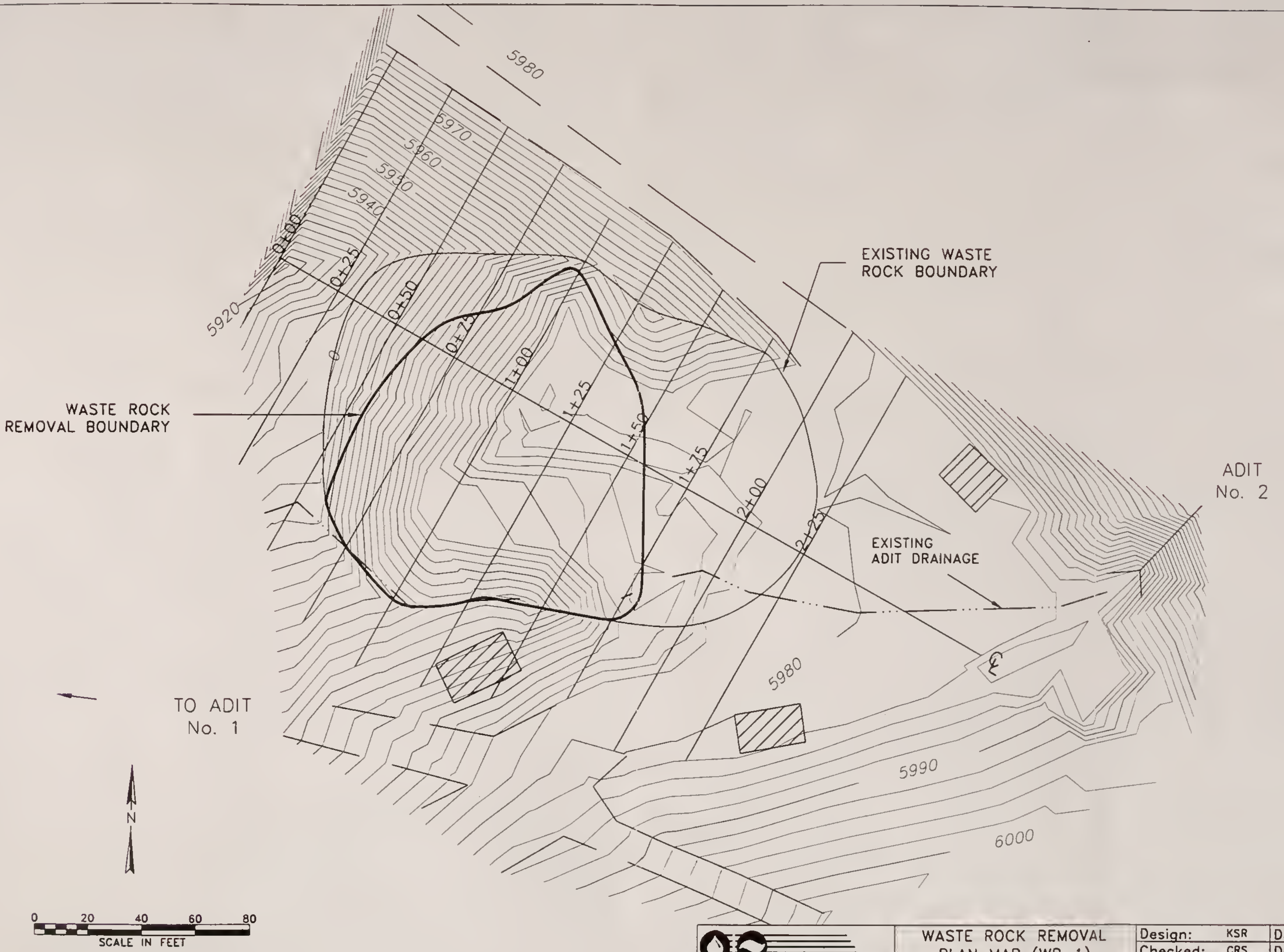
ELEVATION

ROCK-LINED DROP STRUCTURE

NO SCALE

OLYMPUS
ENVIRONMENTAL, INC.

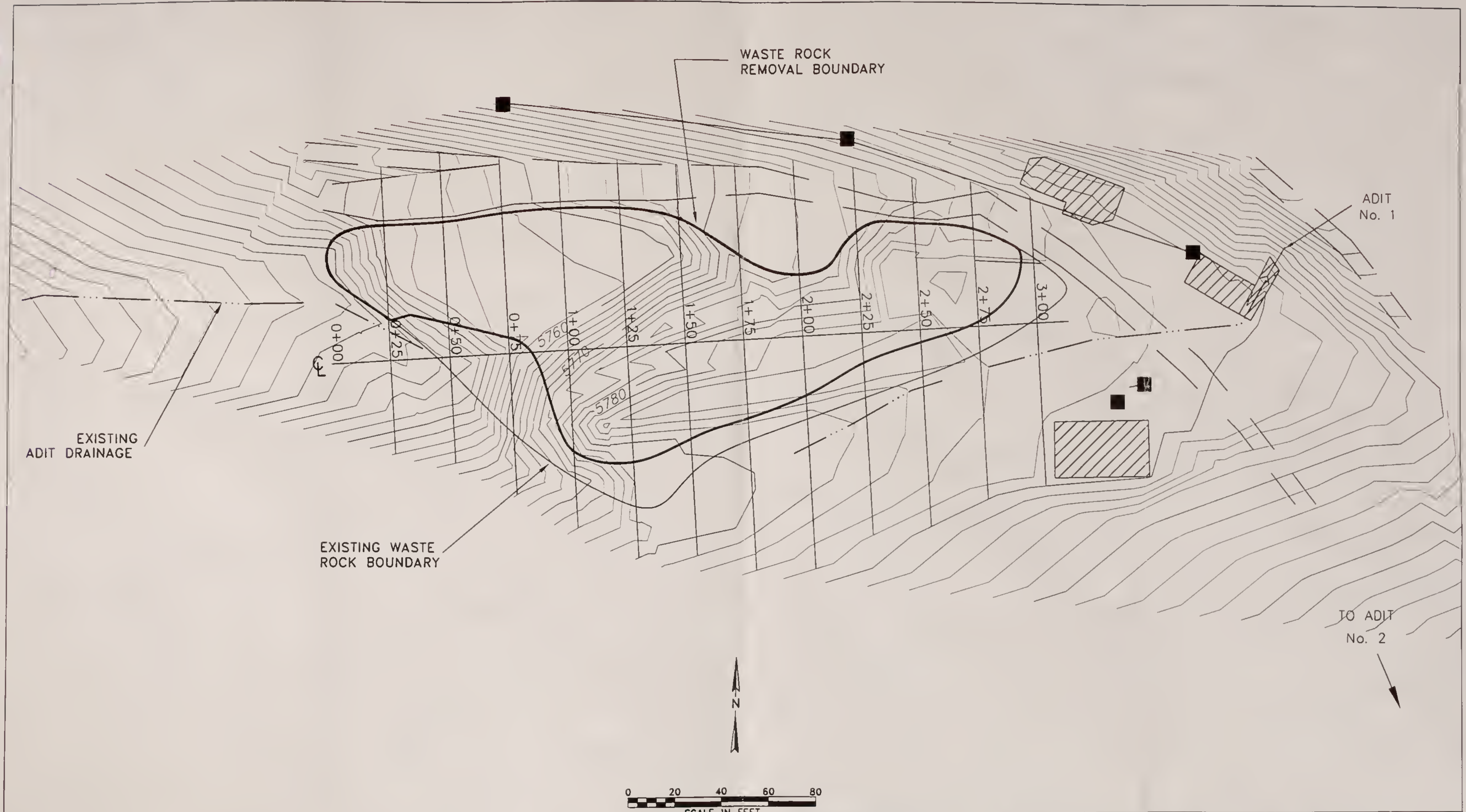
STREAM CHANNEL AND DROP STRUCTURE DETAILS	Design: KSR	Drawn: OGW		SHEET
EMPIRE MINE	Checked: CRS	Date: 7/22/97		17 OF 26
LEWIS AND CLARK COUNTY MONTANA	Approved: KSR	Revision	By	Date
	Job No: 7049-4			
	CAD File: tp-dtls			
	Scale: No Scale			



OLYMPUS ENVIRONMENTAL, INC.

WASTE ROCK REMOVAL
PLAN MAP (WR-1)
EMPIRE MINE
LEWIS AND CLARK COUNTY
MONTANA

Design: KSR	Drawn: KSR			SHEET
Checked: CRS	Date: 7/21/97			
Approved: KSR	Revision	By	Date	
Job No: 7049-4				18 OF 26
CAD File: waste-rock				
Scale: As Shown				



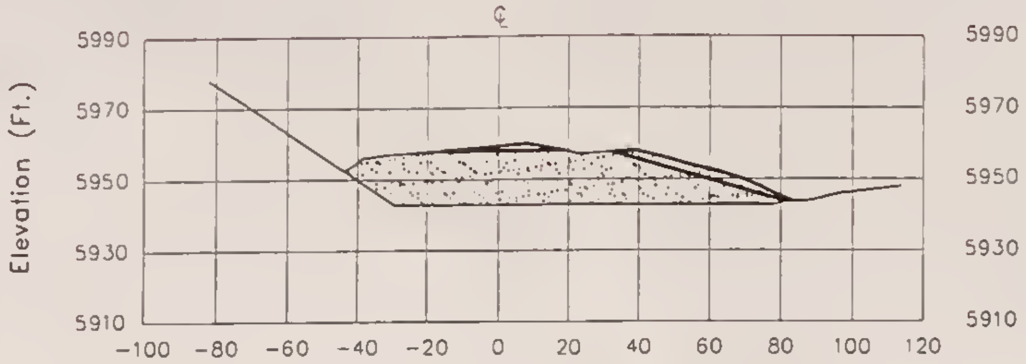
OLYMPUS ENVIRONMENTAL, INC.

WASTE ROCK REMOVAL
PLAN MAP (WR-2)

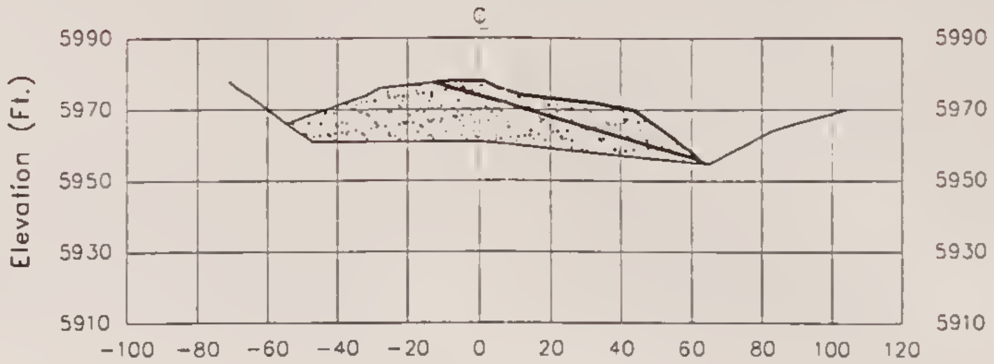
EMPIRE MINE

LEWIS AND CLARK COUNTY
MONTANA

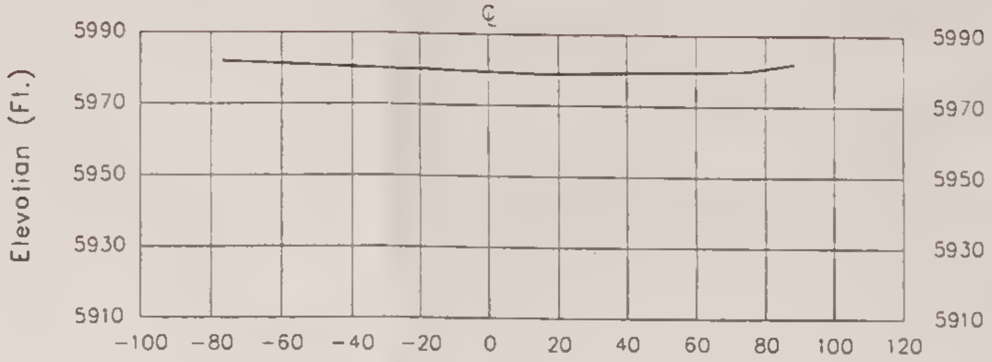
Design: KSR	Drawn: KSR				SHEET
Checked: CRS	Date: 7/21/97				
Approved: KSR	Revision	By	Date		19 OF 26
Job No: 7049-4					
CAD File: waste-rock					
Scale: As Shawn					



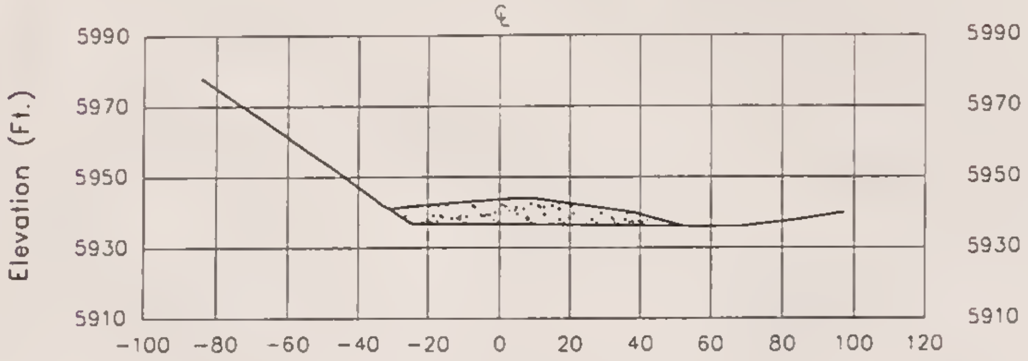
WR-1 STATION 0+75



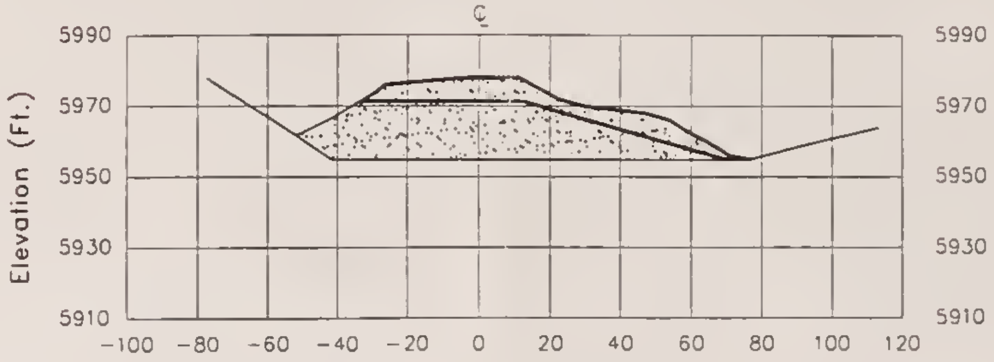
WR-1 STATION 1+50



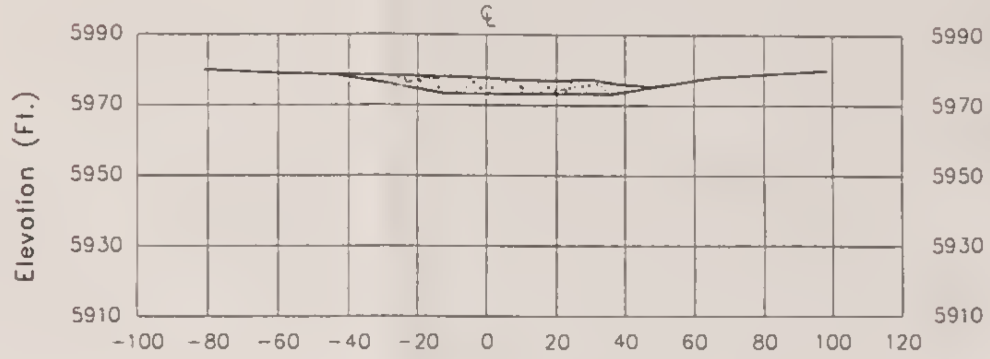
WR-1 STATION 2+25



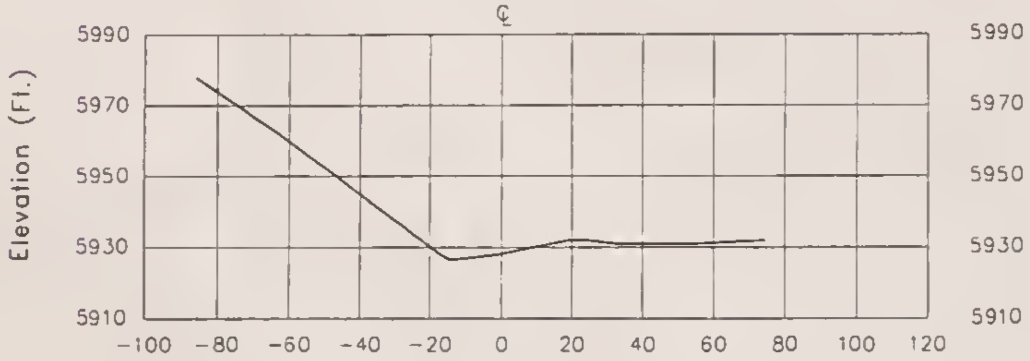
WR-1 STATION 0+50



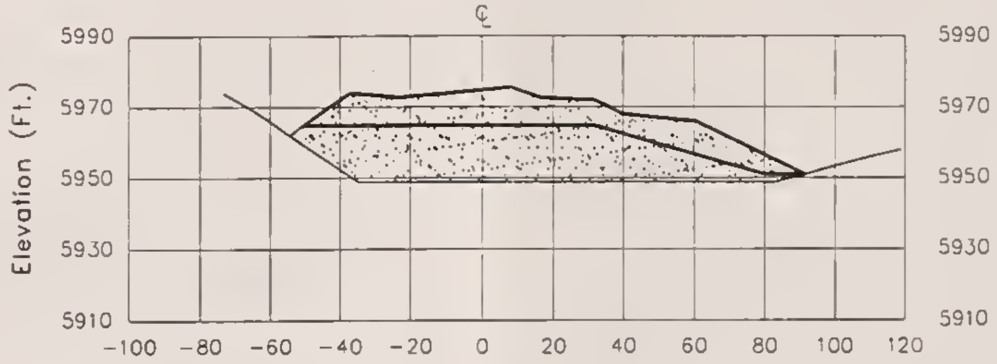
WR-1 STATION 1+25



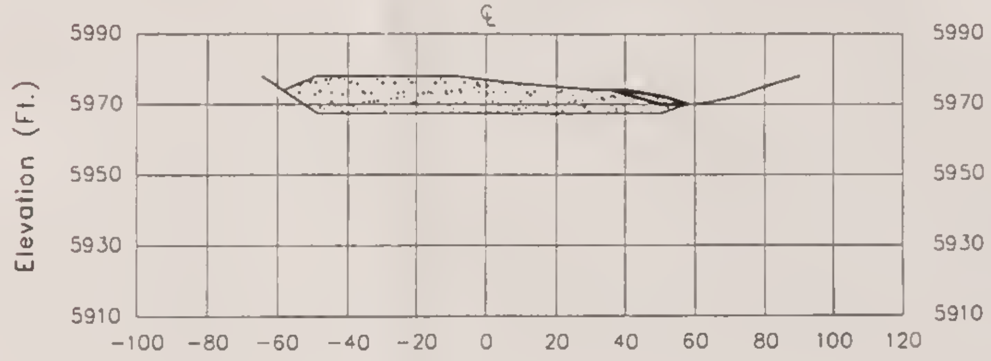
WR-1 STATION 2+00



WR-1 STATION 0+25



WR-1 STATION 1+00



WR-1 STATION 1+75

NOTE: Section Looking Southeast

REFER TO SHT 18 FOR SECTION LOCATIONS

0 30 60 90 120
SCALE IN FEET

LEGEND

▨ Waste Rock Cut

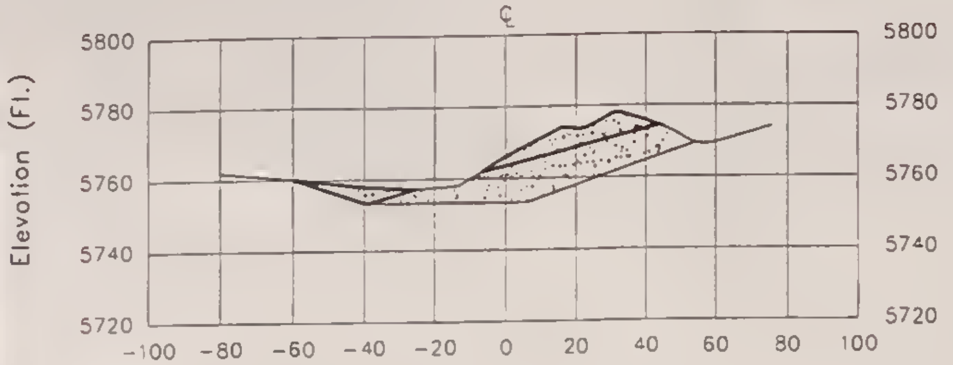
OLYMPUS
ENVIRONMENTAL, INC.

WASTE ROCK REMOVAL
SECTIONS (WR-1)

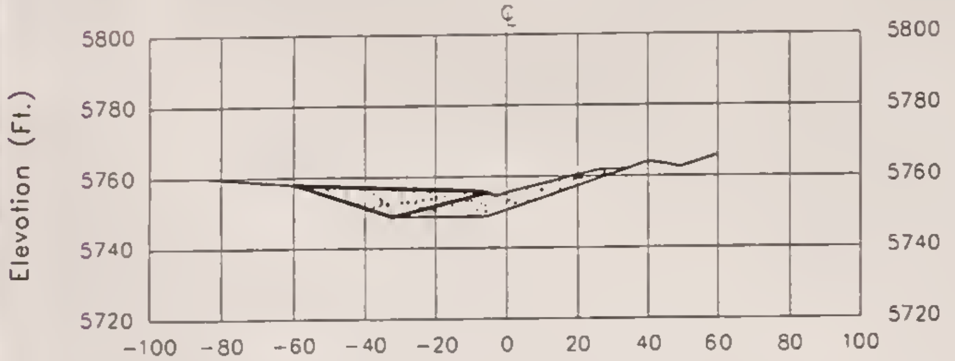
EMPIRE MINE

LEWIS AND CLARK COUNTY
MONTANA

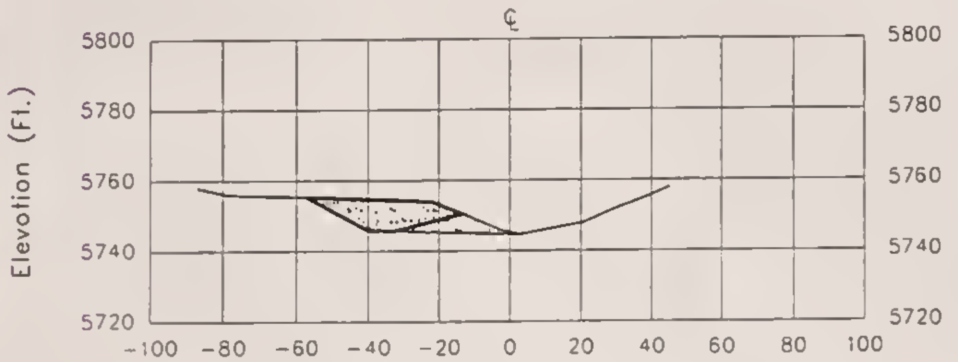
Design: KSR	Drawn: KSR				SHEET
Checked: CRS	Date: 7/21/97				
Approved: KSR	Revision	By	Date		
Job No: 7049-4					20 OF 26
CAD File: wr-sec					
Scale: As Shown					



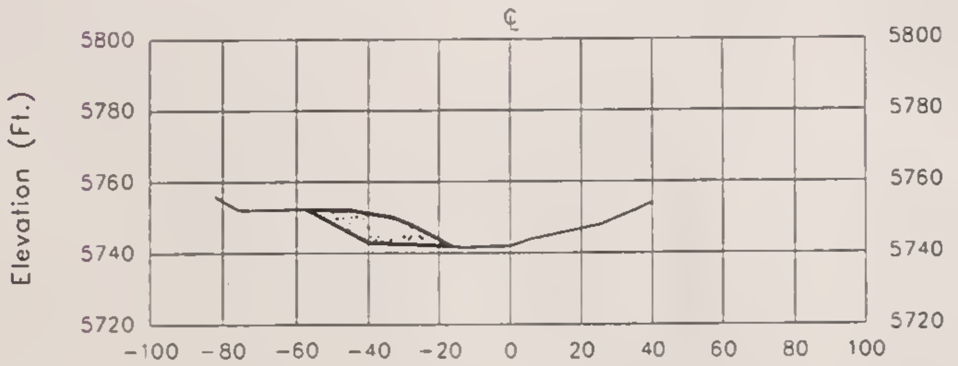
WR-2 STATION 1+00



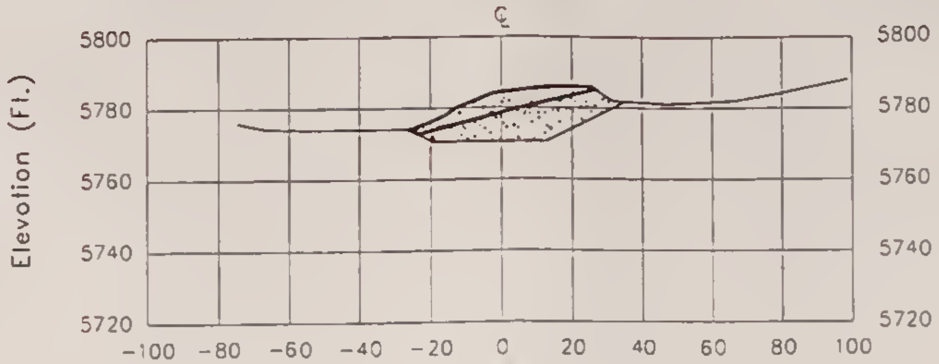
WR-2 STATION 0+75



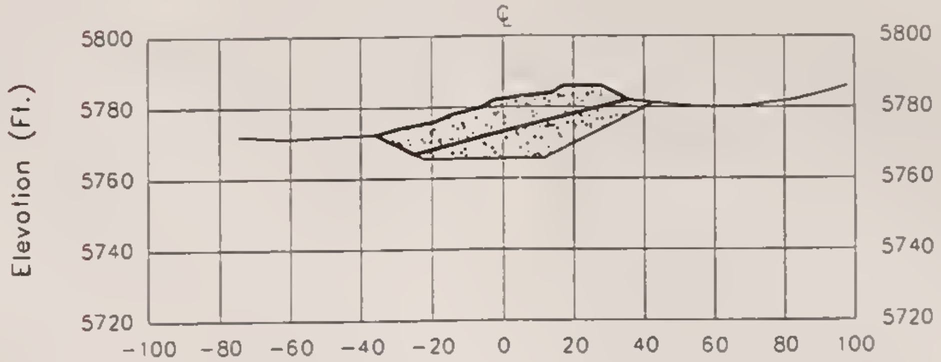
WR-2 STATION 0+50



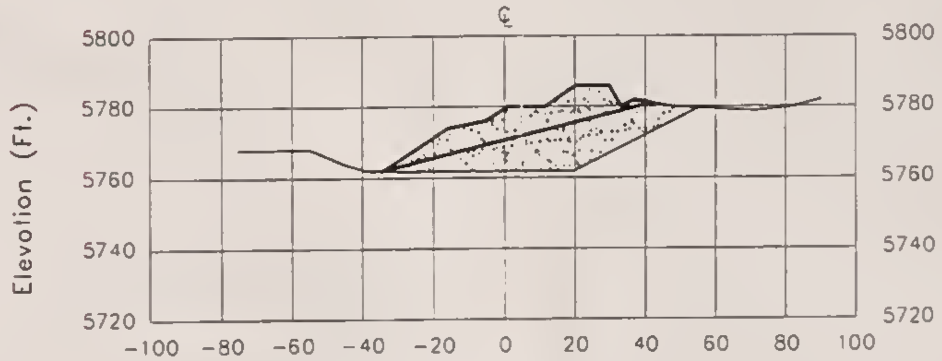
WR-2 STATION 0+25



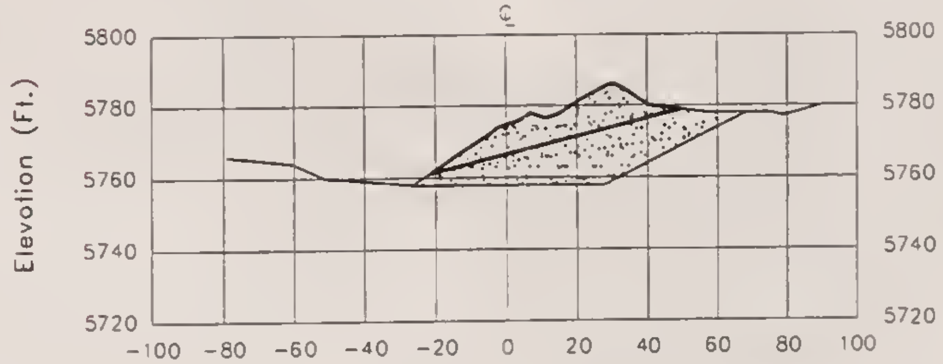
WR-2 STATION 2+00



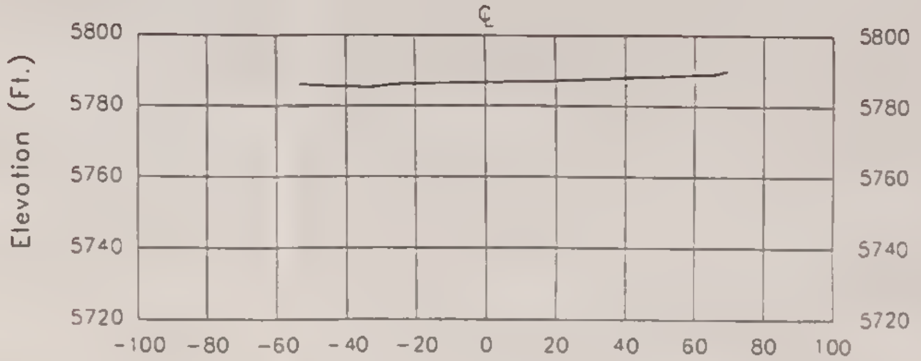
WR-2 STATION 1+75



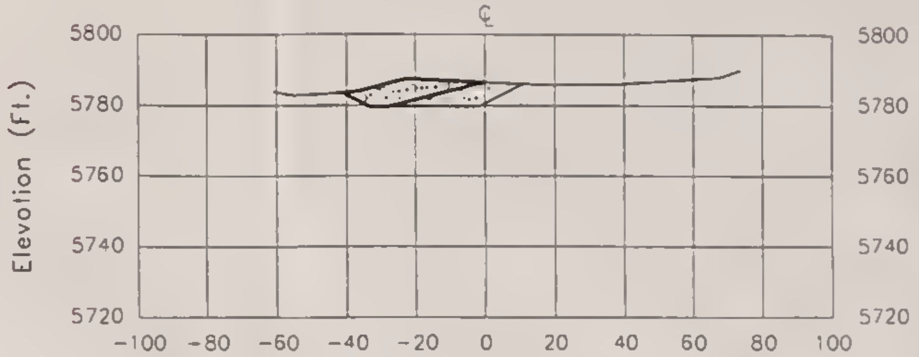
WR-2 STATION 1+50



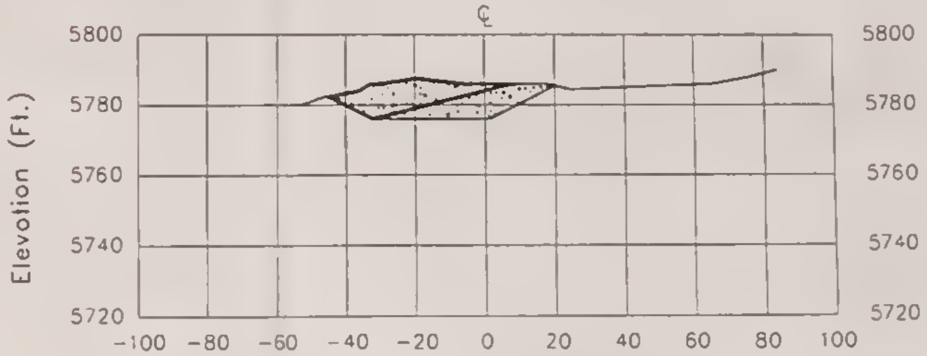
WR-2 STATION 1+25



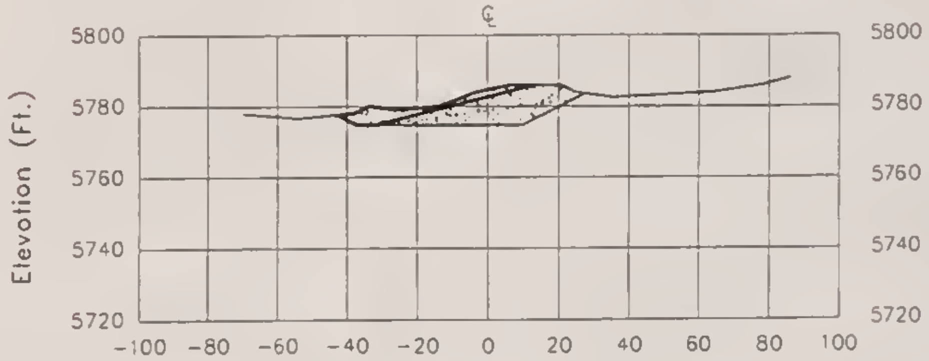
WR-2 STATION 3+00



WR-2 STATION 2+75

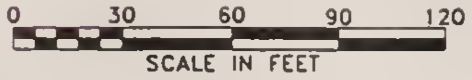


WR-2 STATION 2+50



WR-2 STATION 2+25

NOTE: Section Looking Northeast
REFER TO SHT 19 FOR SECTION LOCATIONS



LEGEND

WASTE ROCK CUT

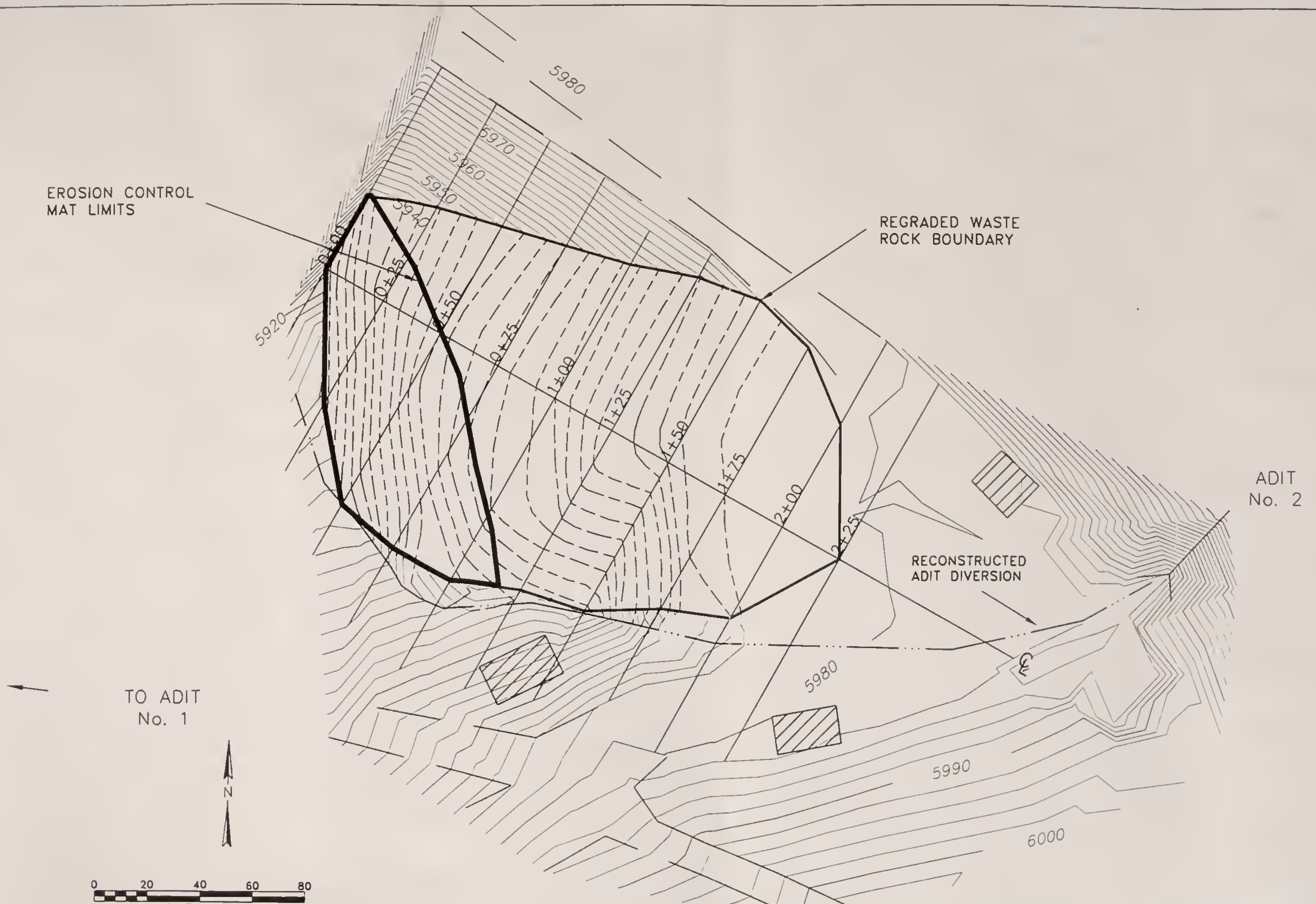
OLYMPUS
ENVIRONMENTAL, INC.

WASTE ROCK REMOVAL
SECTIONS (WR-2)

EMPIRE MINE

LEWIS AND CLARK COUNTY
MONTANA

Design: KSR	Drawn: KSR			SHEET
Checked: CRS	Date: 7/21/97			
Approved: KSR	Revision	By	Date	
Job No: 7049-4				21 OF 26
CAD File: wr-sec				
Scale: As Shown				



OLYMPUS
ENVIRONMENTAL, INC.

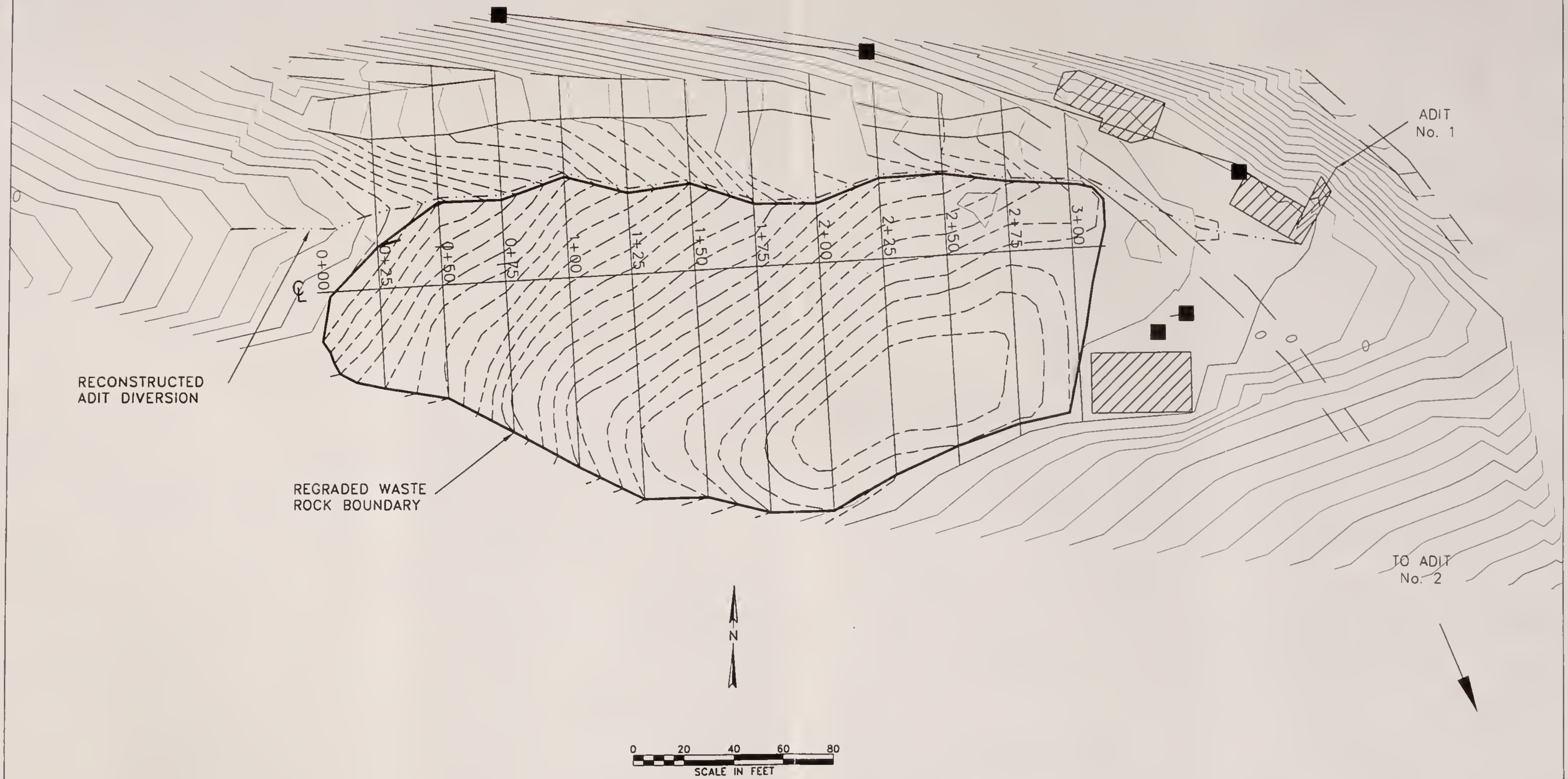
WASTE ROCK FINAL GRADING PLAN MAP (WR-1)
EMPIRE MINE
LEWIS AND CLARK COUNTY
MONTANA

Design: KSR
Checked: CRS
Approved: KSR
Job No: 7049-4
CAD File: waste-rock
Scale: As Shown

Drawn: KSR
Date: 7/21/97

Revision	By	Date

SHEET
22 OF 26



OLYMPUS
ENVIRONMENTAL, INC.

WASTE ROCK FINAL GRADING PLAN MAP (WR-2)

EMPIRE MINE

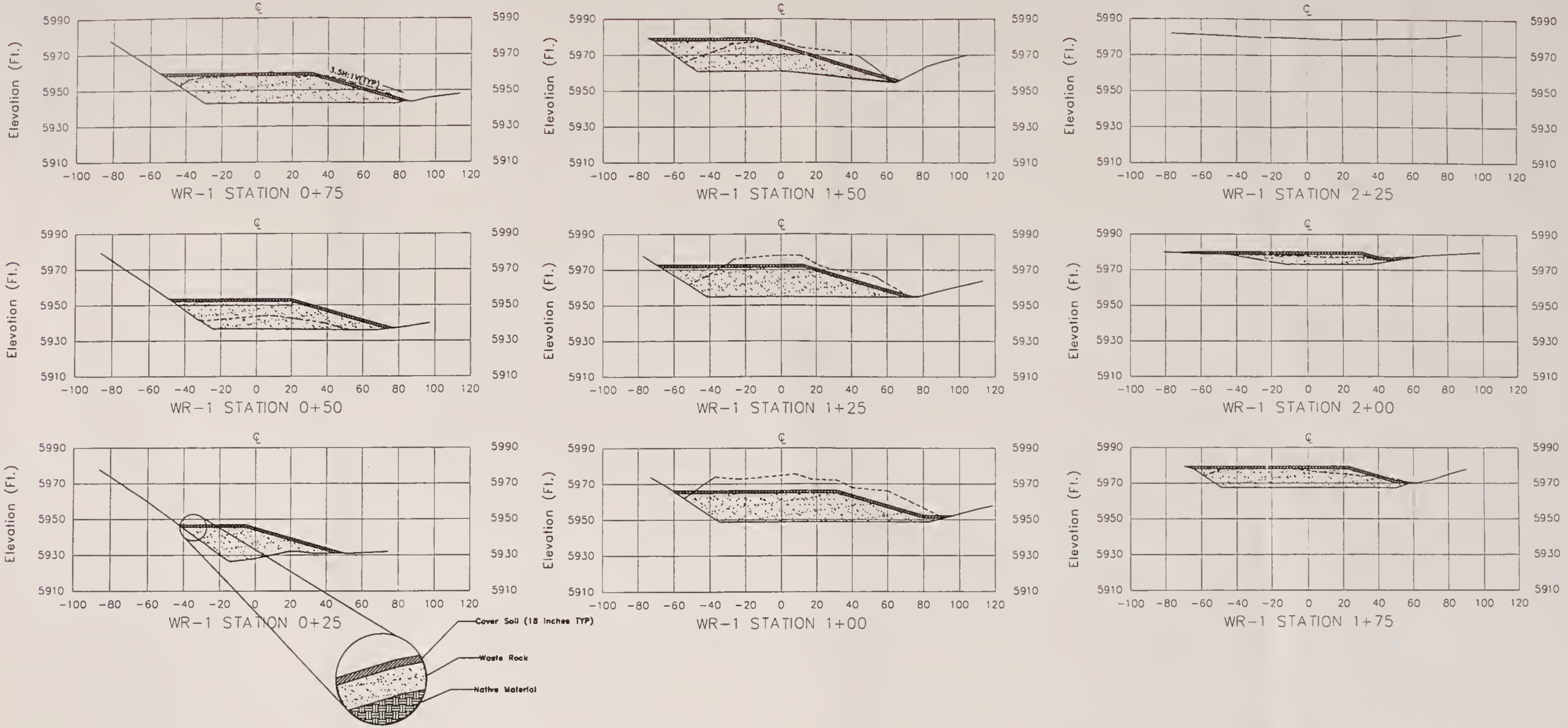
LEWIS AND CLARK COUNTY
MONTANA

Design: KSR
Checked: CRS
Approved: KSR
Job No: 7049-4
CAD File: waste-rock
Scale: As Shown

Drawn: KSR
Date: 7/21/97

Revision	By	Date

SHEET
23 OF 26



NOTE: Section Looking Southeast

Refer to SHT 22 for Section Locations

LEGEND

Pre-Reclamation Waste Rock Surface

Reclaimed Waste Rock

0 30 60 90 120
SCALE IN FEET

OLYMPUS ENVIRONMENTAL, INC.

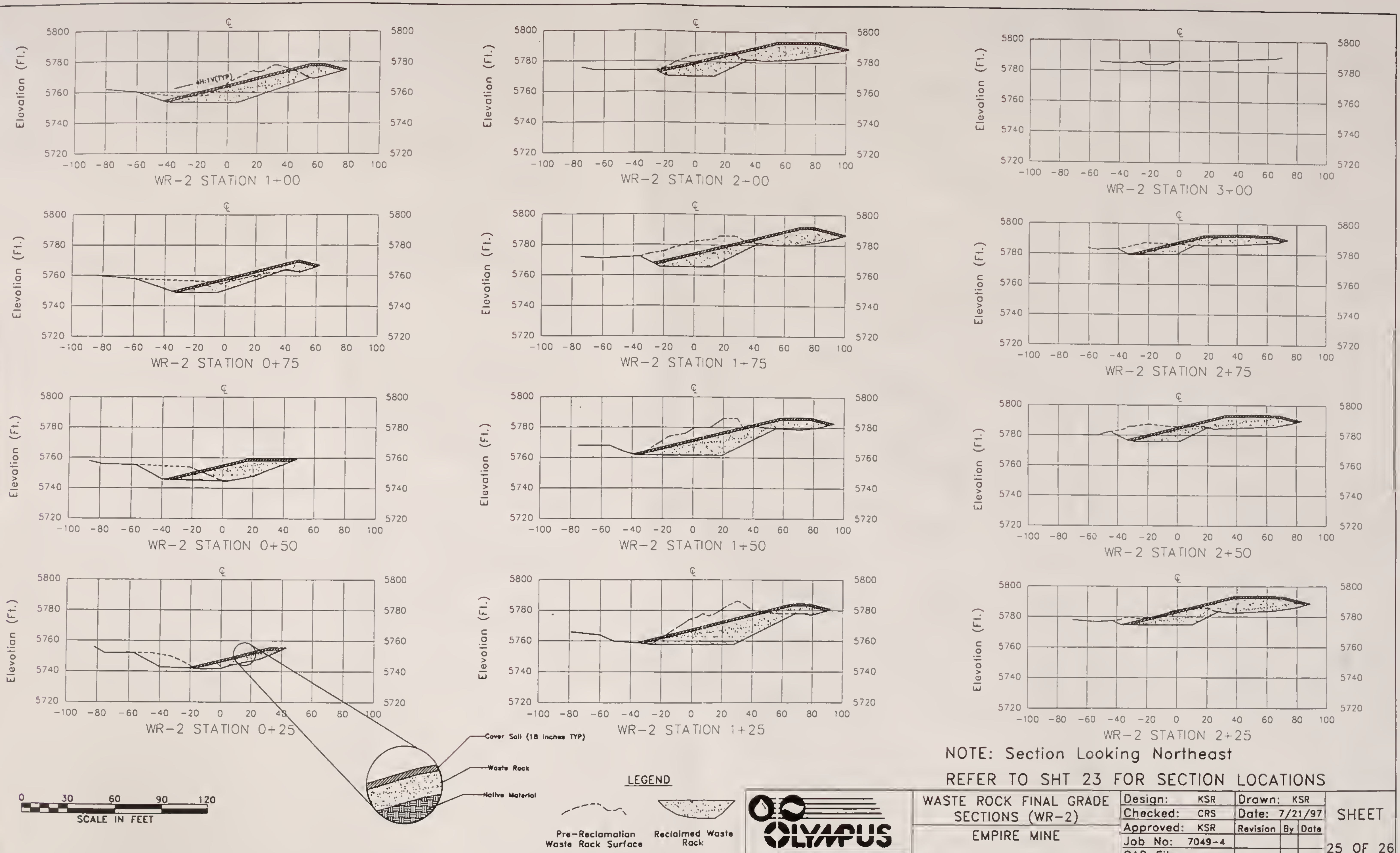
WASTE ROCK FINAL GRADE SECTIONS (WR-1)
EMPIRE MINE
LEWIS AND CLARK COUNTY
MONTANA

Design: KSR
Checked: CRS
Approved: KSR
Job No: 7049-4
CAD File: wr-sec
Scale: As Shown

Drawn: KSR
Date: 7/21/97

Revision	By	Date

SHEET
24 OF 26



NOTE: Section Looking Northeast

REFER TO SHT 23 FOR SECTION LOCATIONS

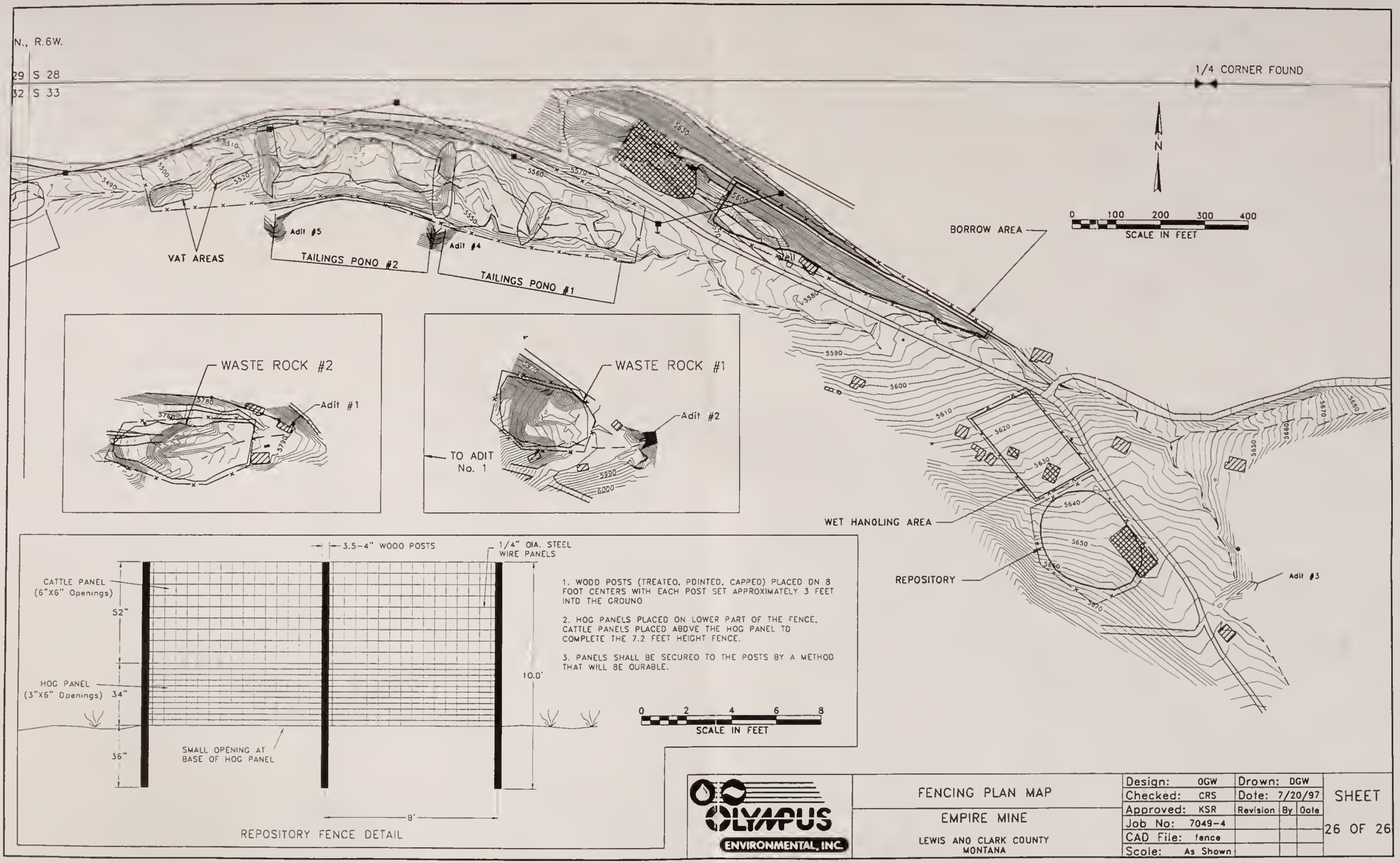
OLYMPUS ENVIRONMENTAL, INC.

WASTE ROCK FINAL GRADE SECTIONS (WR-2)

EMPIRE MINE

LEWIS AND CLARK COUNTY
MONTANA

Design:	KSR	Drawn: KSR			SHEET
Checked:	CRS	Date: 7/21/97			
Approved:	KSR	Revision	By	Date	
Job No:	7049-4				25 OF 26
CAD File:	wr-sec				
Scale:	As Shown				



1. WOOD POSTS (TREATED, POINTED, CAPPED) PLACED ON 8 FOOT CENTERS WITH EACH POST SET APPROXIMATELY 3 FEET INTO THE GROUND

2. HOG PANELS PLACED ON LOWER PART OF THE FENCE. CATTLE PANELS PLACED ABOVE THE HOG PANEL TO COMPLETE THE 7.2 FEET HEIGHT FENCE.

3. PANELS SHALL BE SECURED TO THE POSTS BY A METHOD THAT WILL BE DURABLE.

REPOSITORY FENCE DETAIL

OLYMPUS
ENVIRONMENTAL, INC.

FENCING PLAN MAP

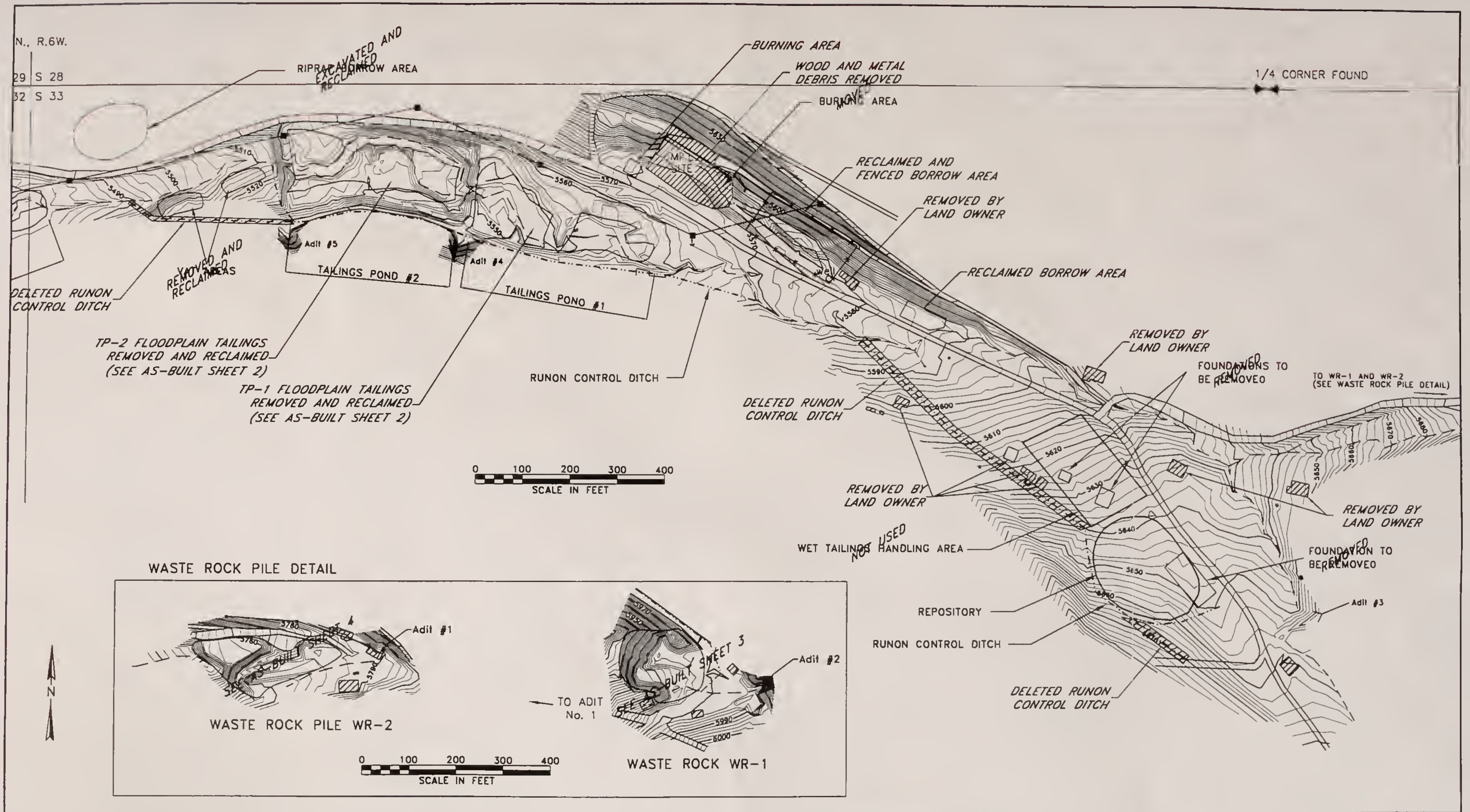
EMPIRE MINE

LEWIS AND CLARK COUNTY
MONTANA

Design: DGW	Drawn: DGW			SHEET
Checked: CRS	Date: 7/20/97			
Approved: KSR	Revision	By	Date	
Job No: 7049-4				26 OF 26
CAD File: fence				
Scale: As Shown				

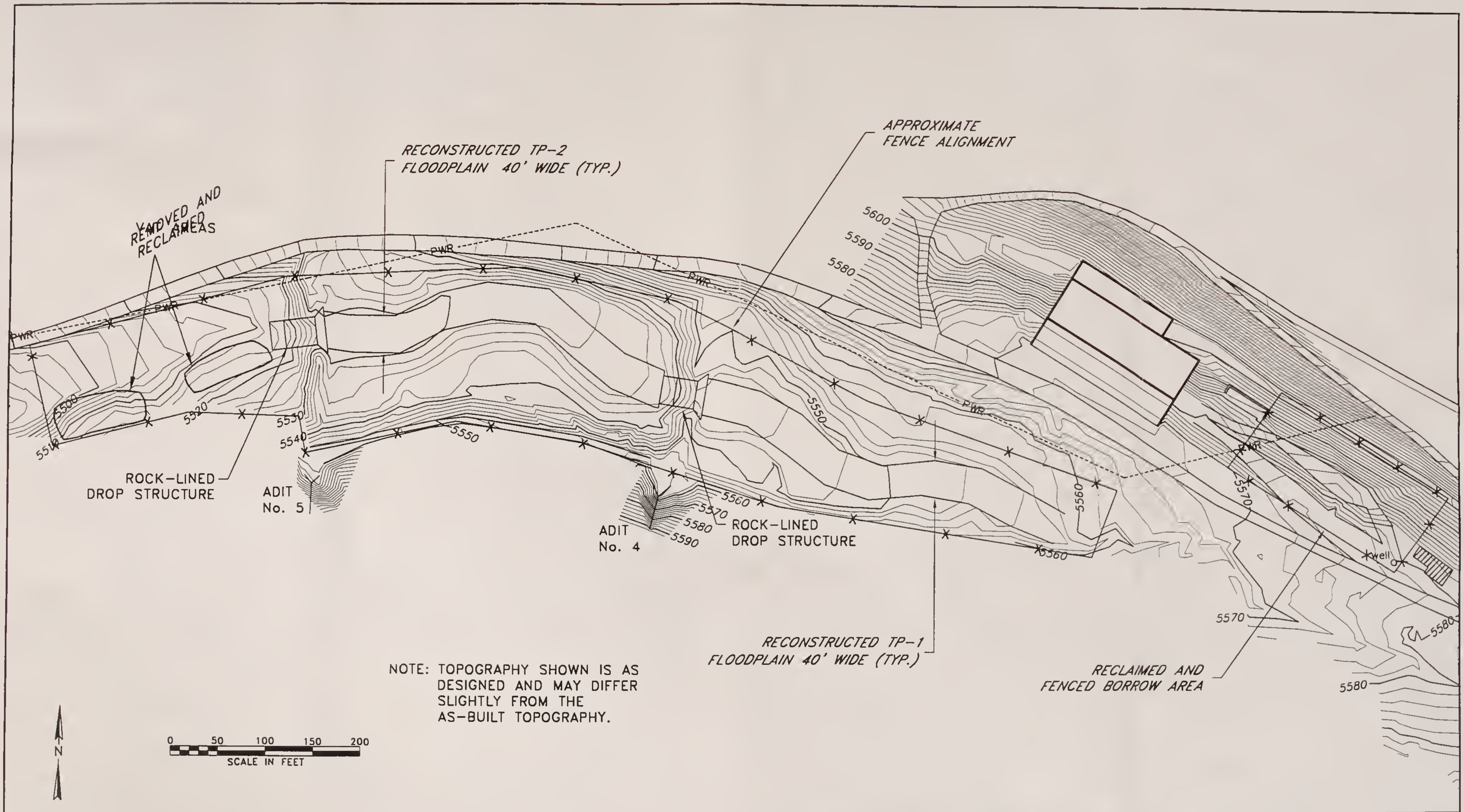
APPENDIX I

AS-BUILT DRAWINGS



OLYMPUS ENVIRONMENTAL, INC.

Design:	Drawn: KSR		AS-BUILT SITE PLAN	SHEET
Checked: CRS	Date: 12/1/97		EMPIRE MINE	1 OF 4
Approved: KSR	Rev	By	Date	LEWIS AND CLARK COUNTY MONTANA
Job No: 7049-7				
CAD File: ASB-SITE				
Scale: AS SHOWN				

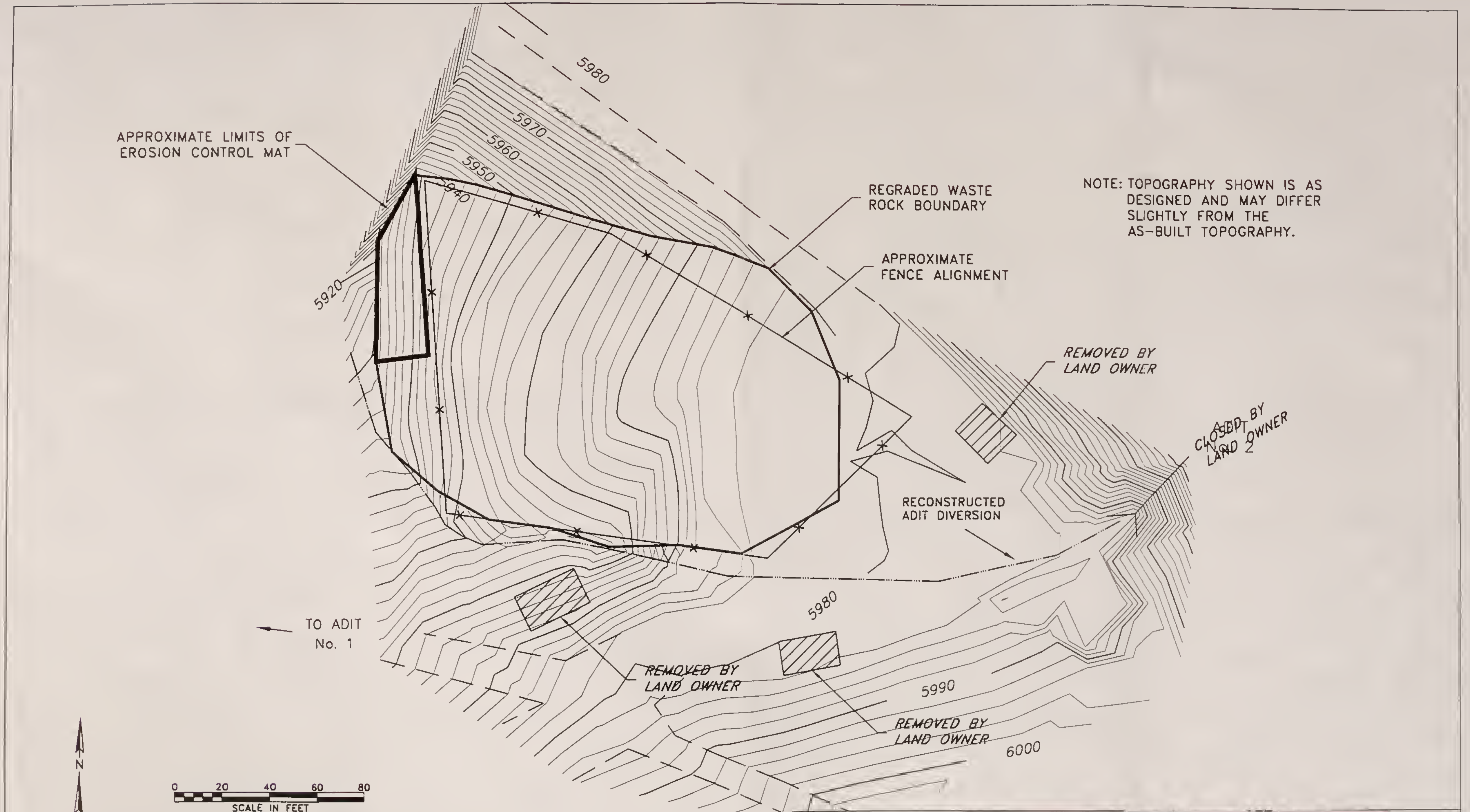


REMOVED AND RECLAIMED AREAS
RECONSTRUCTED TP-2 FLOODPLAIN 40' WIDE (TYP.)
APPROXIMATE FENCE ALIGNMENT
PWR
5500
5510
5520
5530
5540
5550
5560
5570
5580
5590
5600
ROCK-LINED DROP STRUCTURE
ADIT No. 5
ADIT No. 4
ROCK-LINED DROP STRUCTURE
well
RECONSTRUCTED TP-1 FLOODPLAIN 40' WIDE (TYP.)
RECLAIMED AND FENCED BORROW AREA
0
50
100
150
200
SCALE IN FEET
N

NOTE: TOPOGRAPHY SHOWN IS AS DESIGNED AND MAY DIFFER SLIGHTLY FROM THE AS-BUILT TOPOGRAPHY.

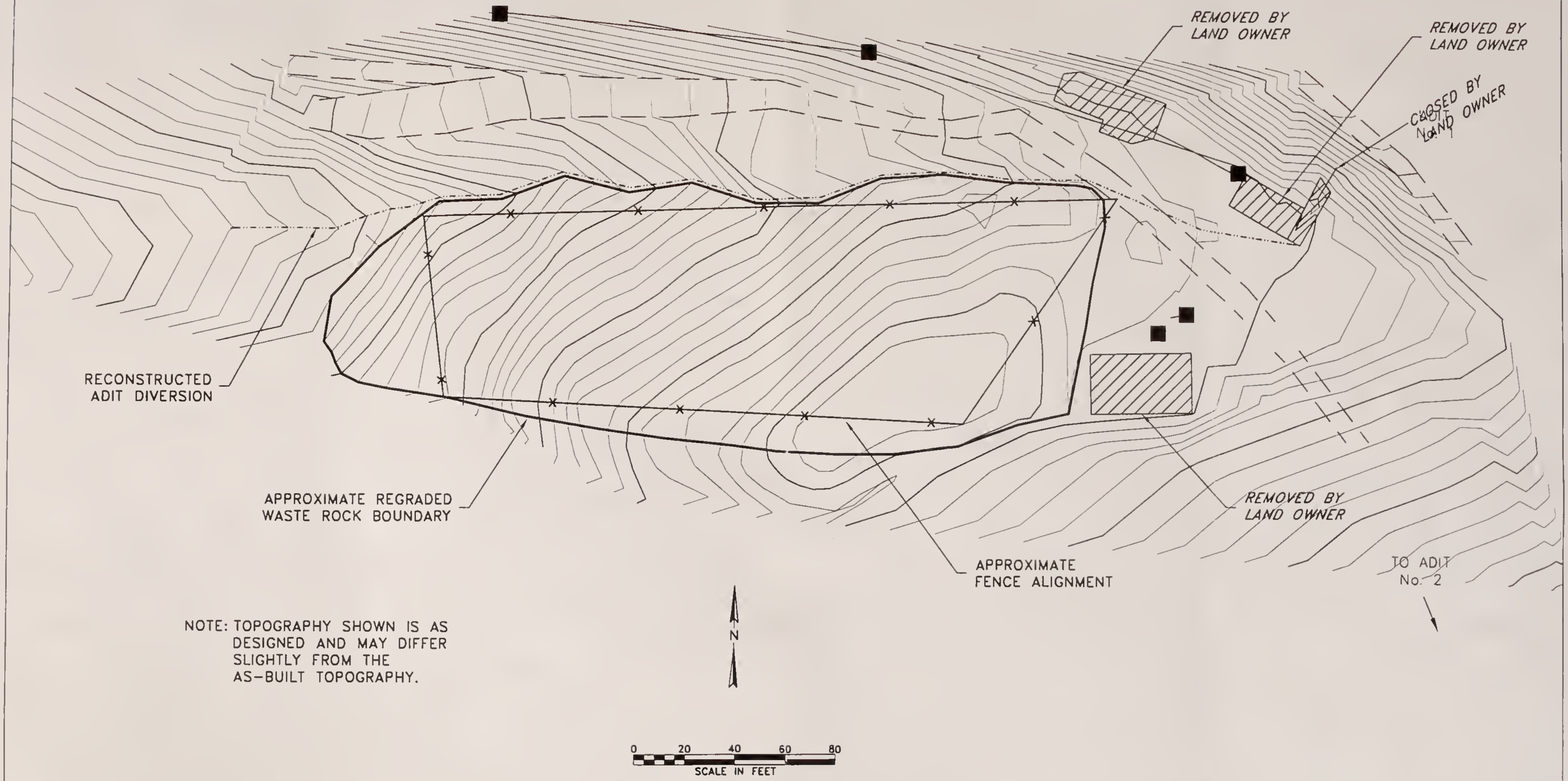
OLYMPUS ENVIRONMENTAL, INC.

Design:	Drawn: KSR		TAILINGS PILE TP-1 AND TP-2 AS-BUILT	SHEET
Checked: CRS	Date: 12/1/97			
Approved: KSR	Rev / By / Date		EMPIRE MINE	2 OF 4
Job No: 7049-7			LEWIS AND CLARK COUNTY MONTANA	
CAD File: ASB-TP				
Scale: AS SHOWN				


5980
5970
5960
5950
5940
5920
APPROXIMATE LIMITS OF EROSION CONTROL MAT
REGRADED WASTE ROCK BOUNDARY
APPROXIMATE FENCE ALIGNMENT
NOTE: TOPOGRAPHY SHOWN IS AS DESIGNED AND MAY DIFFER SLIGHTLY FROM THE AS-BUILT TOPOGRAPHY.
REMOVED BY LAND OWNER
CLOSED BY LAND OWNER
ADIT No. 2
RECONSTRUCTED ADIT DIVERSION
TO ADIT No. 1
5980
REMOVED BY LAND OWNER
5990
REMOVED BY LAND OWNER
6000
N
0
20
40
60
80
SCALE IN FEET

OLYMPUS ENVIRONMENTAL, INC.

Design:	Drawn: KSR	WASTE ROCK PILE WR-1 AS-BUILT	SHEET
Checked: CRS	Date: 12/1/97		
Approved: KSR	Rev | By | Date	EMPIRE MINE	3 OF 4
Job No: 7049-7			
CAD File: ASB-WR		LEWIS AND CLARK COUNTY MONTANA	
Scale: AS SHOWN			



NOTE: TOPOGRAPHY SHOWN IS AS DESIGNED AND MAY DIFFER SLIGHTLY FROM THE AS-BUILT TOPOGRAPHY.

OLYMPUS ENVIRONMENTAL, INC.	Design:	Drawn: KSR			WASTE ROCK PILE WR-2 AS-BUILT	SHEET
	Checked: CRS	Date: 12/1/97				
	Approved: KSR	Rev	By	Date	EMPIRE MINE	4 OF 4
	Job No: 7049-7					
	CAD File: ASB-WR				LEWIS AND CLARK COUNTY MONTANA	
	Scale: AS SHOWN					

APPENDIX J

PHOTOGRAPHS

Photo No.	Date	Description
1	9/8/97	Overview of the Empire Mill site looking northwest from the repository area.
2	9/16/97	View of the historic Empire Mill foundation looking east.
3	9/8/97	View of building foundation in the repository area looking northwest.
4	9/8/97	View of building foundation northwest of the repository looking northwest.
5	9/17/97	Concrete foundation debris removed from the repository area.
6	9/17/97	Clearing and grubbing the repository surface.
7	9/19/97	Topsoil stripped from the repository footprint and stockpiled south of the repository.
8	10/2/97	Diversion pipe and erosion control mat in the main material staging area south of the mill.
9	9/19/97	Excavation of the tailings pile diversion and runon control ditch from the upstream end looking downstream (west).
10	9/25/97	View of the temporary stream diversion pipe and ditch from the downstream end looking upstream (east).
11	9/25/97	View of the discharge end of the temporary stream diversion pipe.
12	9/25/97	View of the temporary discharge pipe (background) and the diverted water flowing down the channel below Adit No. 5.
13	9/25/97	View of the terrace east of the mill (background) that was the main borrow source and the compost stockpile (center) looking northeast.
14	10/3/97	Excavation of cover soil from the terrace east of the mill looking northeast. Note the organic compost pile in the foreground.
15	10/3/97	Overview of the site looking southeast from the hillside north of the tailings piles. Note the borrow area by the mill and compost pile (left), the county road through the site (center), the main material staging area (right), and repository (background).
16	10/6/97	Loading cover soil from the borrow area east of the mill into haul trucks to haul to WR-1.
17	10/20/97	Replacing topsoil on the main borrow area east of the mill prior to seeding, fertilizing, and mulching.

Photo No.	Date	Description
18	10/24/97	View of the borrow area east of the mill after reclamation looking east. Note the mill foundation on the left.
19	10/28/97	Excavation of cover soil from the road slope south of WR-2 looking west.
20	10/30/97	View of the borrow area south of WR-2 after reclamation looking west.
21	10/28/97	View of the borrow area east of the mill after reclamation looking east
22	9/30/97	Overview of WR-2 looking west prior to grading. Compare with Photo No. 23.
23	10/2/97	Overview of WR-2 looking west after grading, cover soil placement, seeding, fertilizing, and partial mulching. Compare with Photo No. 23.
24	9/30/97	View of WR-2 looking west-southwest prior to grading. Compare with Photo No. 27.
25	9/25/97	View of WR-2 looking southeast prior to grading. Compare with Photo No. 26.
26	10/15/97	View of WR-2 looking southeast after grading and cover soil placement. Compare with Photo No. 25.
27	10/25/97	View of WR-2 looking west-southwest after grading, seeding, fertilizing, mulching, and fencing. Compare with Photo No. 24.
28	9/30/97	Overview of WR-1 looking southwest during debris removal and the start of grading. Compare with Photo No. 29.
29	10/20/97	Overview of WR-1 looking southwest after grading, cover soil placement, seeding, fertilizing and mulching. Compare with Photo No. 28.
30	9/30/97	View of WR-1 from the lower toe looking east during grading operations.
31	9/30/97	View of WR-1 from the toe looking northeast prior to grading. Compare with Photo No. 32.
32	10/9/97	View of WR-1 from the toe looking northeast after grading and during cover soil placement. Compare with Photo No. 31.
33	10/10/97	View of WR-1 looking southeast after grading and cover soil placement.
34	9/19/97	View of Empire Creek at the upstream end of TP-1 looking downstream prior to installing the temporary diversion.
35	9/25/97	View of Empire Creek channel at the upstream end of TP-1 looking upstream after the temporary diversion was installed.

Photo No.	Date	Description
36	10/28/97	View of the WR-1 adit drainage ditch from the toe of WR-1 looking upstream (east).
37	9/15/97	View of the vat area tailings from the upper end looking southwest prior to reclamation. Compare with Photo No. 38.
38	10/20/97	View of the vat area tailings from the upper end looking southwest after tailings removal and reclamation. Compare with Photo No. 37.
39	10/20/97	View of the vat area from the county road looking southeast after reclamation.
40	9/15/97	View from the south side of TP-2 below the TP-1 dam looking northeast across TP-2 prior to reclamation.
41	10/15/97	Overview of tailings excavation from TP-2 looking from the hillside north of TP-2 to the southwest.
42	10/10/97	View of the haul road across the TP-1 floodplain looking south from the county road.
43	9/15/97	View along the north side of TP-2 from the TP-2 dam looking east prior to reclamation. Compare with Photo No. 44.
44	10/20/97	View along the north side of TP-2 from the TP-2 dam looking east after tailings removal and grading, floodplain backfilling and grading, floodplain seeding and fertilizing, and installation of erosion mat. Compare with Photo No. 43.
45	10/15/97	Haul truck stuck in wet tailings near the north end of the TP-2 dam.
46	9/15/97	View of TP-2 from the county road near the TP-1 dam looking west prior to reclamation. Compare with Photo No. 47.
47	10/30/97	View of TP-2 from the county road near the TP-1 dam looking west after reclamation. Compare with Photo No. 46.
48	10/7/97	Stormwater Best Management Practices to protect Empire Creek from sediment. The view is from the county road looking upstream at Empire Creek at the junction of the county road and the road to the waste rock piles.
49	9/15/97	View of TP-1 from the upper end looking west at the eastern portion of TP-1.
50	9/15/97	View of tailings pile TP-1 from the center of the pile on the south side looking northwest toward the dam.

Photo No.	Date	Description
51	10/20/97	View of TP-2 from the county road looking west after backfilling and grading operations. Note the silt fence to protect Empire Creek from sediment during construction.
52	10/20/97	Excavation of tailings from the north side of TP-1 (foreground) near the dam (right) and backfilling and grading of the TP-1 floodplain on the south side of TP-1 (background).
53	10/20/97	Backfilling and grading of the TP-1 floodplain. Note the erosion control mat anchored in the backfill and ready to lay over the backfilled floodplain.
54	10/21/97	Overview of the TP-1 floodplain reconstruction from the mill looking southwest. Note the temporary diversion pipe (background), the stream channel (which has been left undisturbed), vegetated floodplain areas that have been left in place (dark green), and the erosion control mat placed in excavated floodplain areas.
55	10/28/97	Erosion control mat placed in the excavated floodplain on TP-1 after backfilling, seeding and fertilizing. The erosion mat is anchored in a trench adjacent to the floodplain (lower left and lower right) and stapled in place.
56	10/29/97	View of the TP-1 floodplain looking upstream at the upper end of TP-1 after reconstruction. Note the undisturbed stream channel (right), vegetated floodplain area left undisturbed (center), and erosion control mat installed on the floodplain and adjacent slope (left).
57	10/29/97	View of the upper portion of the reconstructed TP-1 floodplain looking downstream. Erosion control mat was placed where tailings were removed adjacent to the Empire Creek streambed.
58	9/25/97	View of the riprap borrow source from the TP-2 dam looking northwest prior to excavating riprap. Compare with Photo No. 59.
59	10/22/97	View of the riprap borrow source from the TP-2 dam looking northwest while excavating and stockpiling riprap. Compare with Photo No. 58.
60	10/30/97	View of the lower portion of the reconstructed TP-1 floodplain looking upstream from the TP-1 dam. Note the erosion control mat placed on both sides of the floodplain where tailings were removed.
61	10/23/97	Loading riprap into a haul truck. The view is from below the TP-2 dam looking northwest.
62	10/21/97	Excavating and stockpiling in the riprap borrow area northwest of TP-2.
63	10/28/97	View of the riprap borrow source after reclamation.

Photo No.	Date	Description
64	9/15/97	View of the TP-2 dam outfall prior to construction from below the dam looking upstream (east). Compare with Photo No. 65.
65	10/28/97	View of the TP-2 dam outfall after construction of the riprap-lined drop structure from below the dam looking upstream (east-southeast). Compare with Photo No. 64
66	10/23/97	Placement of riprap in the TP-2 drop structure outlet.
67	9/15/97	View of the TP-1 dam outfall prior to construction from below the dam looking upstream (east). Compare with Photo No. 68.
68	10/29/97	View of the TP-1 dam outfall after construction of the riprap-lined drop structure from below the dam looking upstream (east). Compare with Photo No. 67.
69	10/24/97	Construction of the TP-1 drop structure from below the dam looking upstream (east). Note the filter fabric placed beneath the riprap.
70	10/29/97	Overview of TP-1 (right) and TP-2 (center) after reclamation looking southwest from the ridge above the mill.
71	10/29/97	View of the repository looking northeast after grading and placement of cover soil. Note the fence construction around the upgradient side of the repository.
72	11/5/97	Overview of the repository from the ridge above the mill looking south after reclamation. Note the runon control ditch and fencing.

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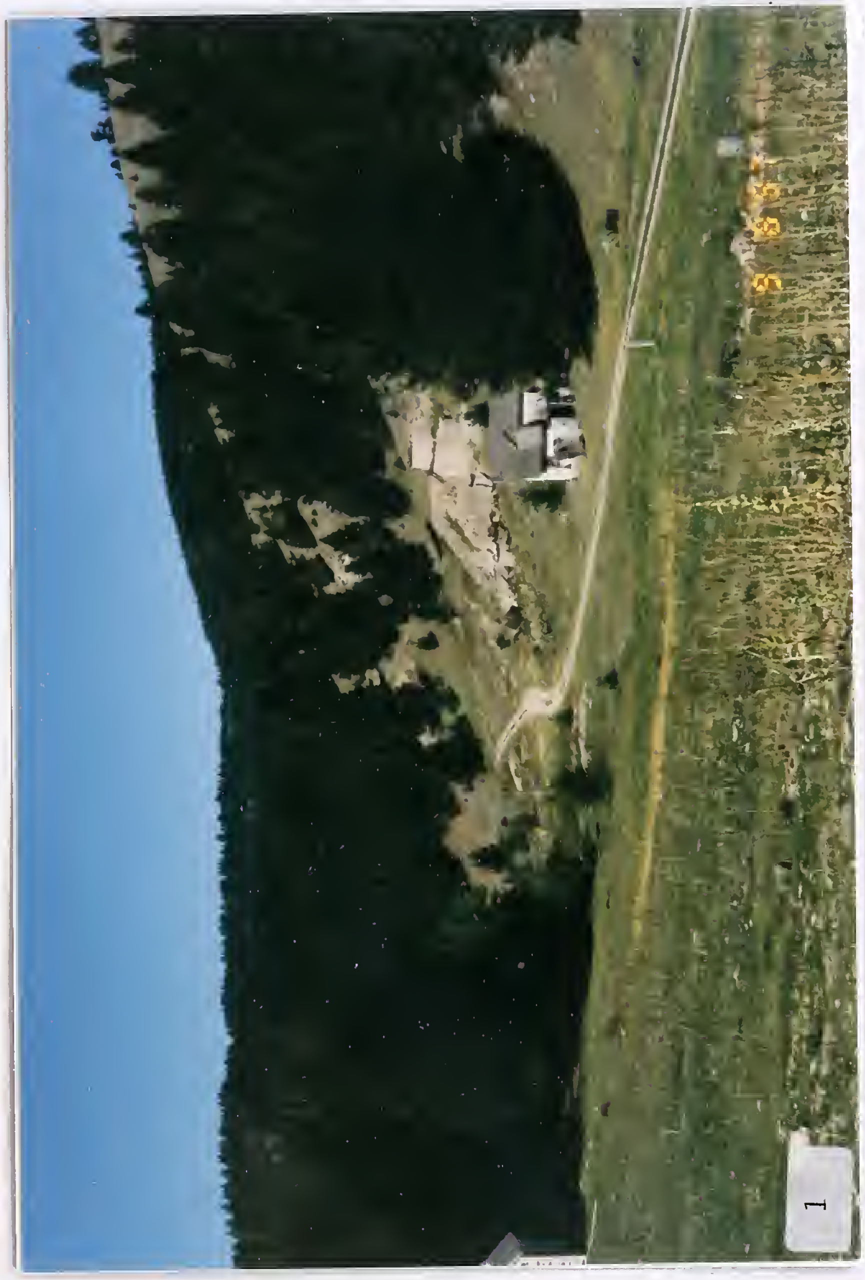
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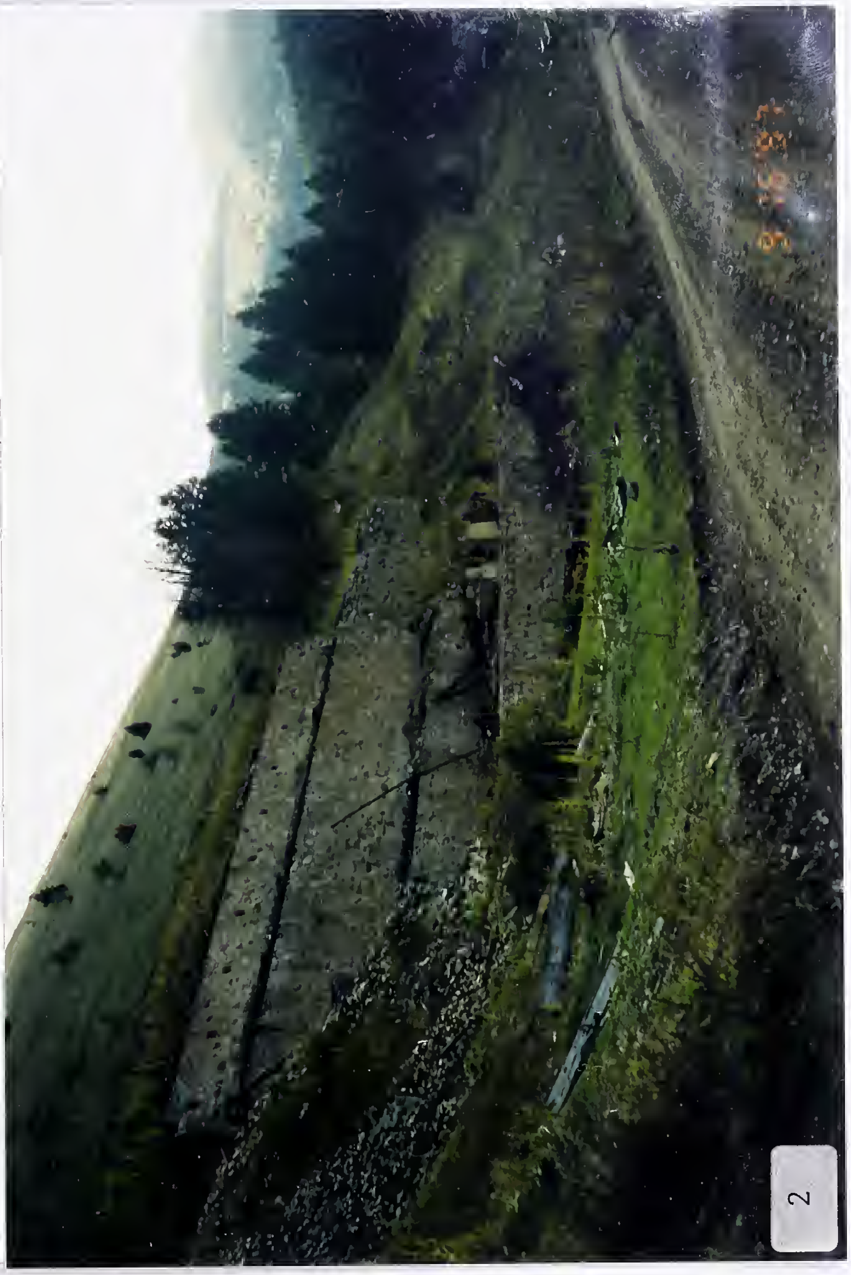
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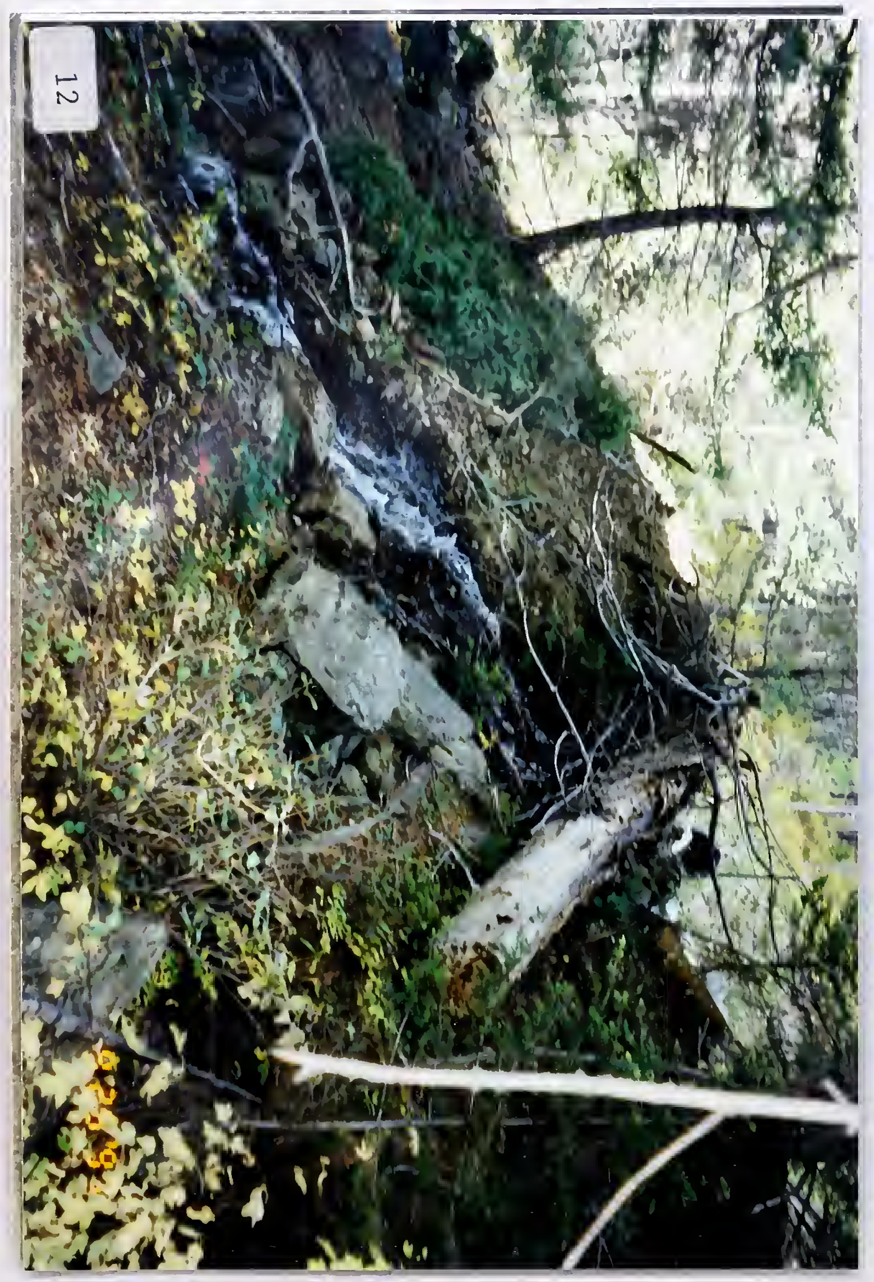

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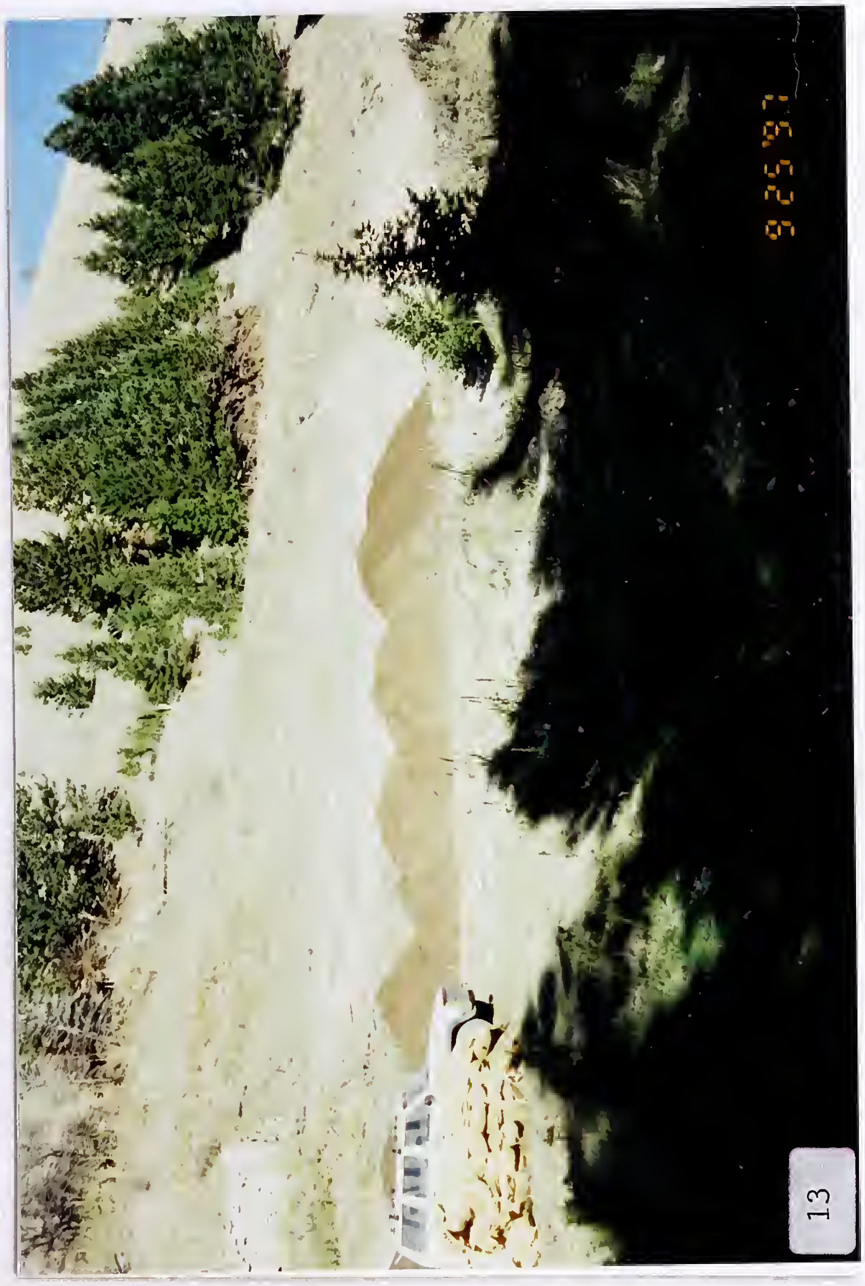

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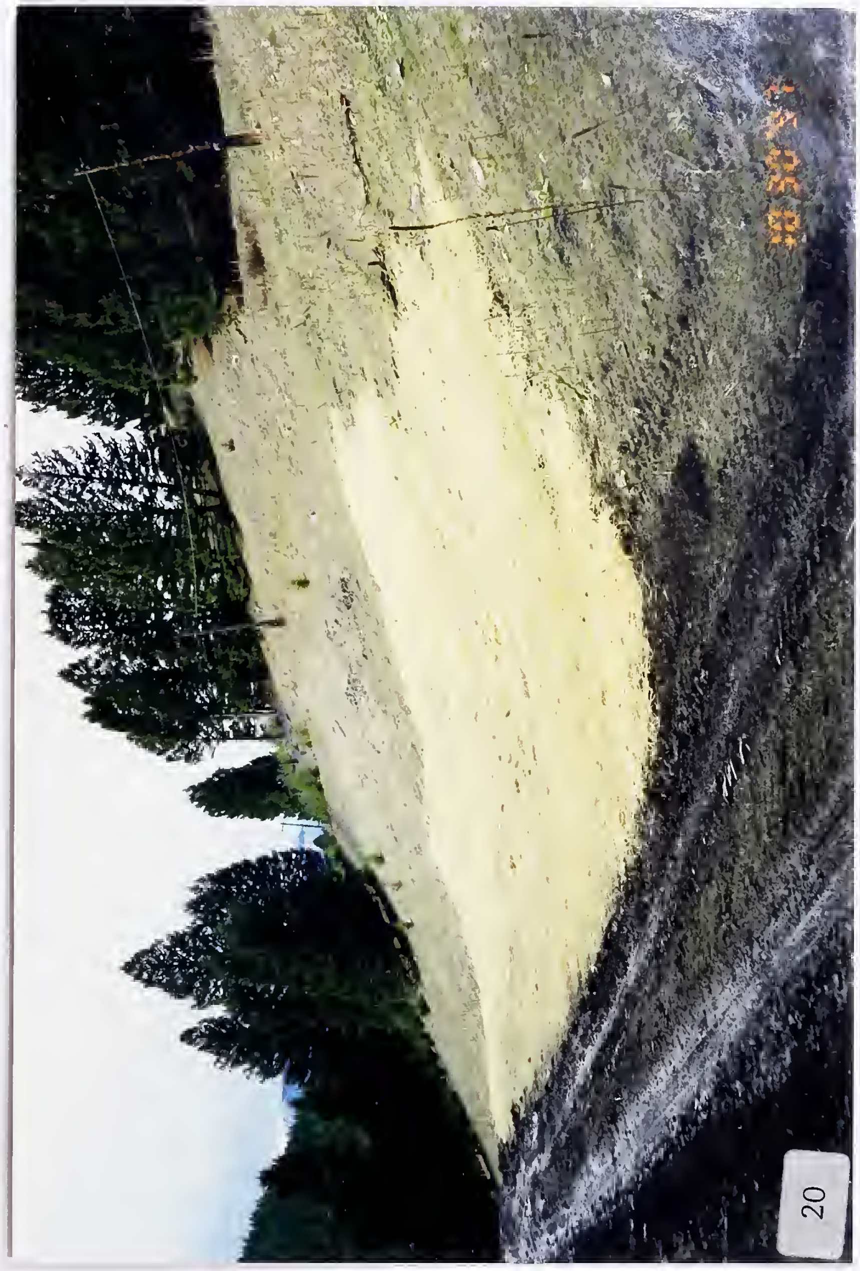

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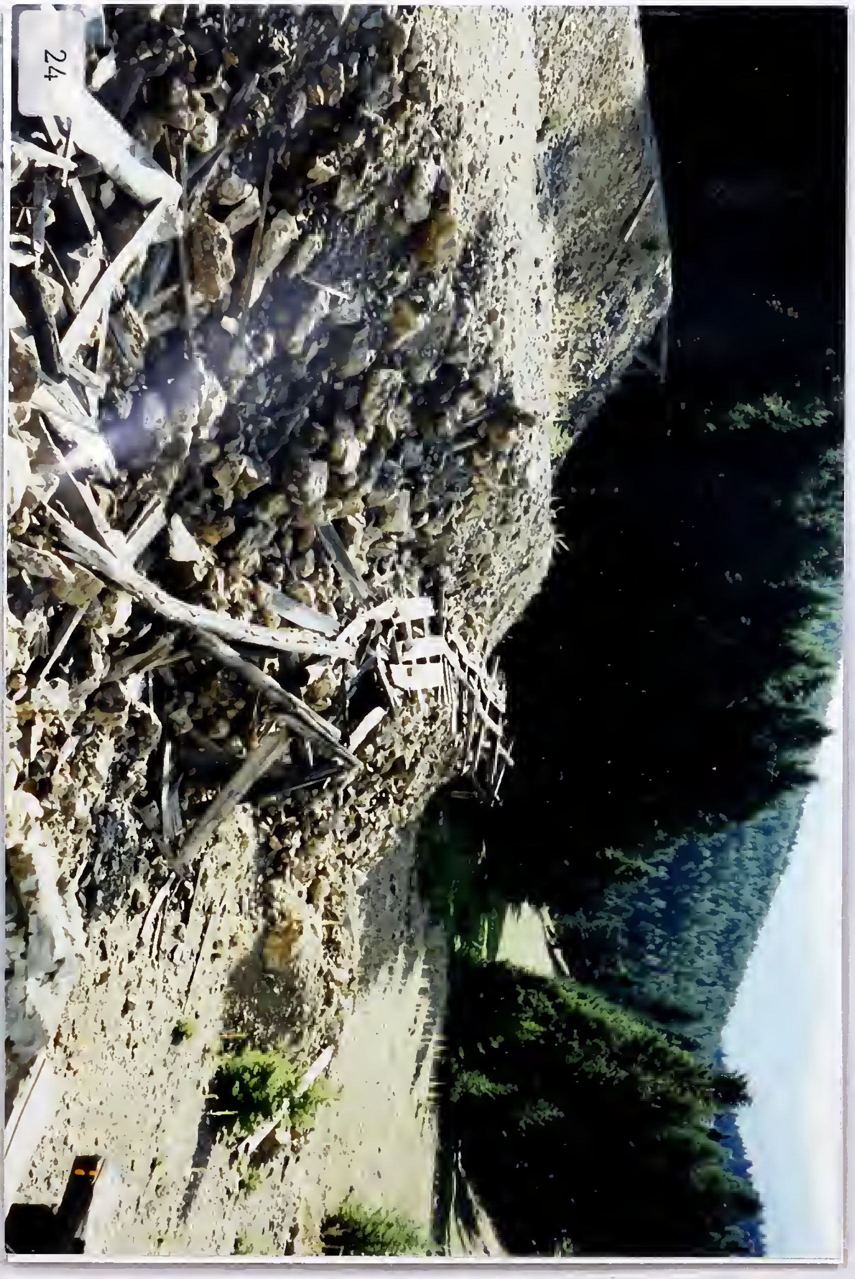
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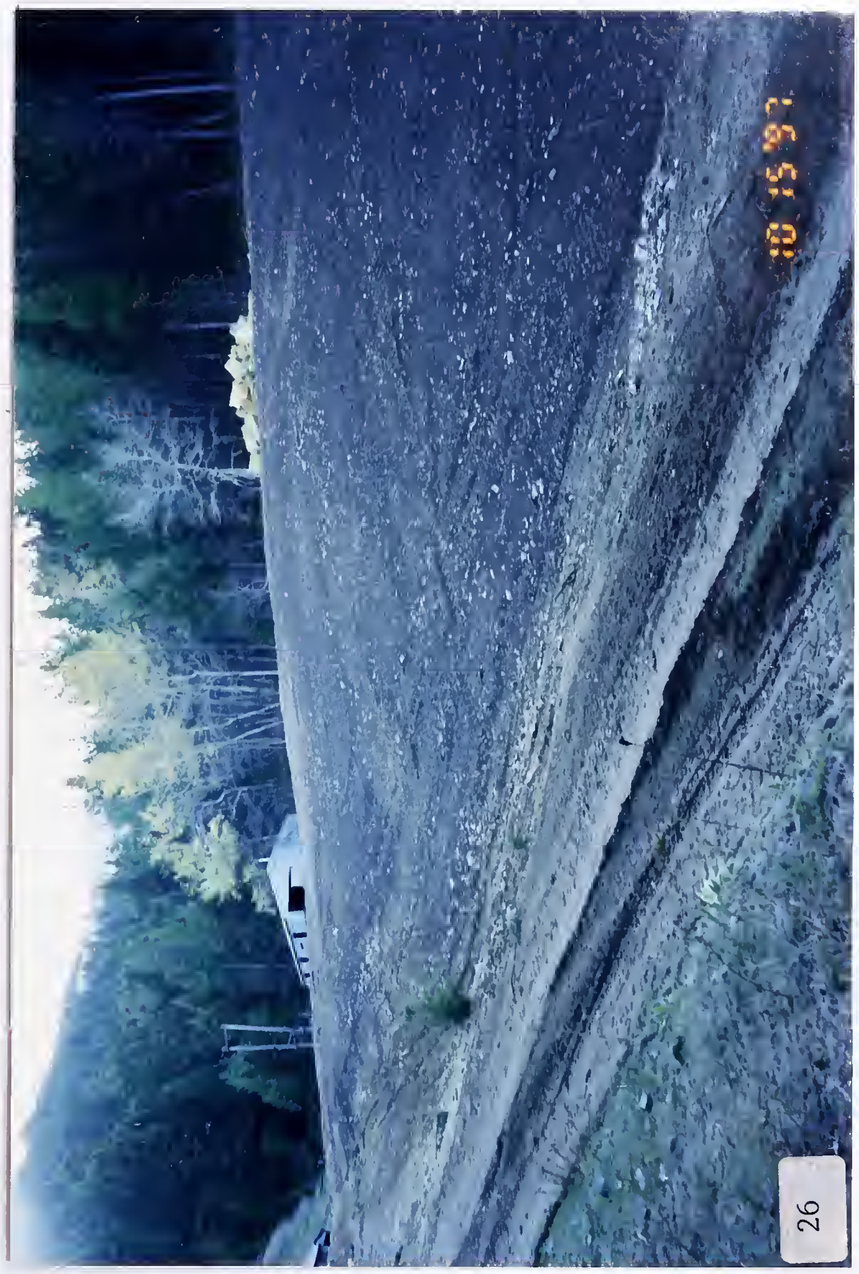

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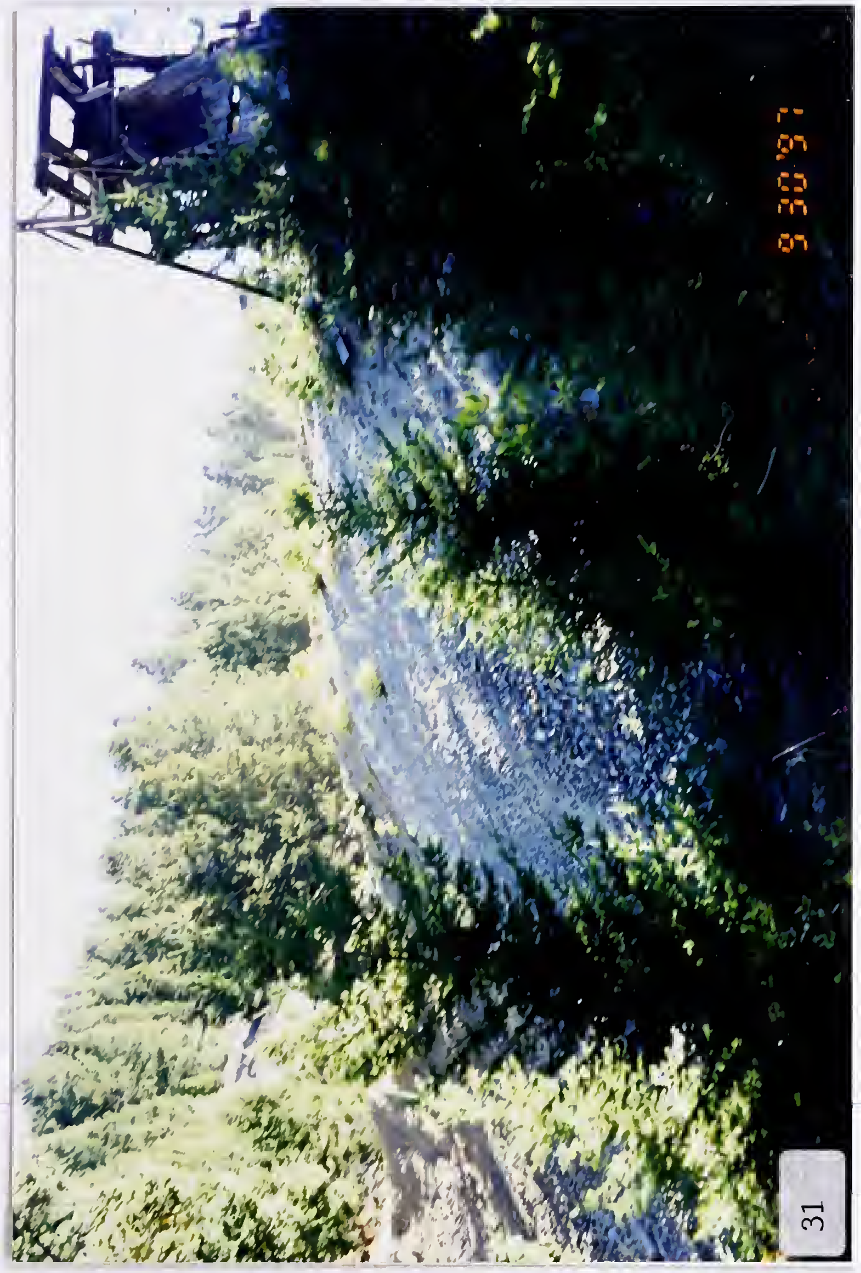

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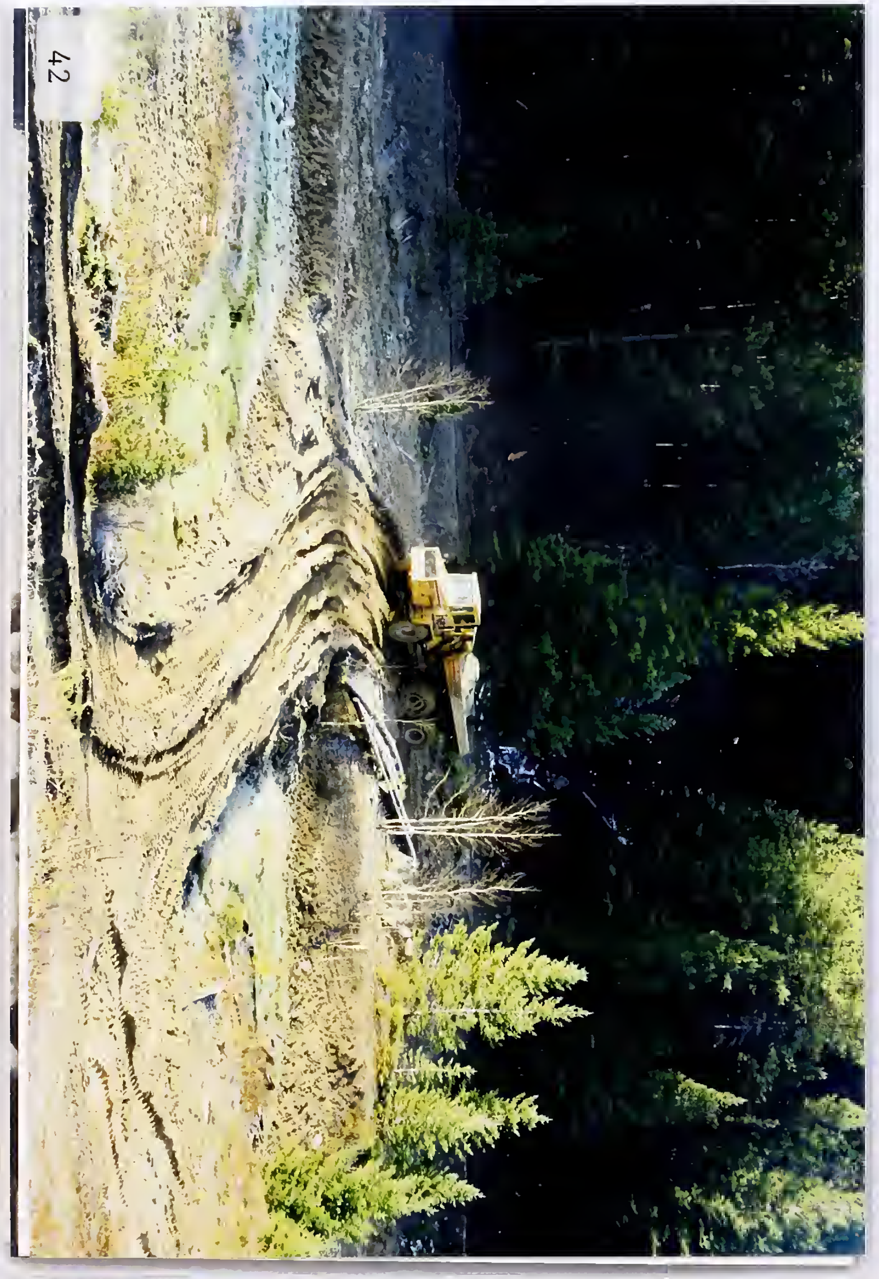
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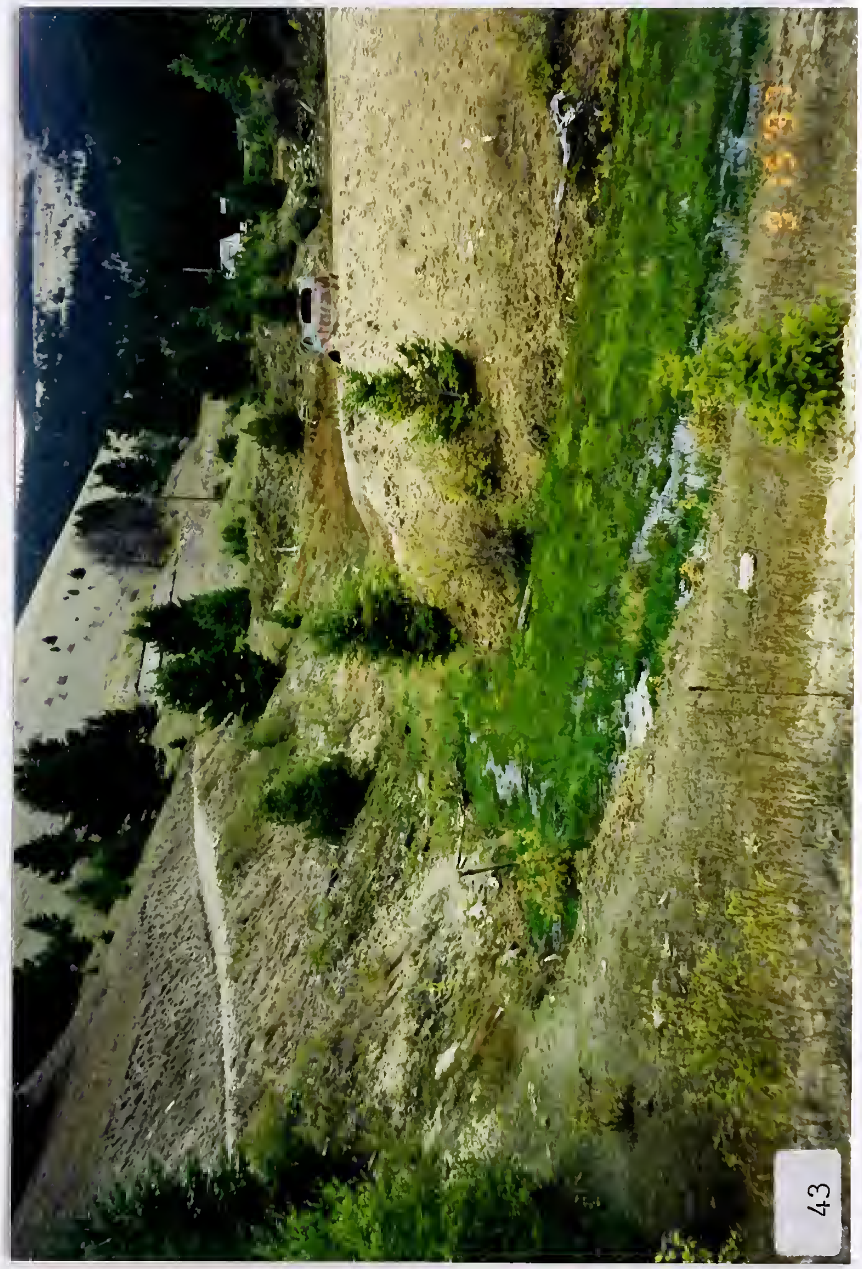

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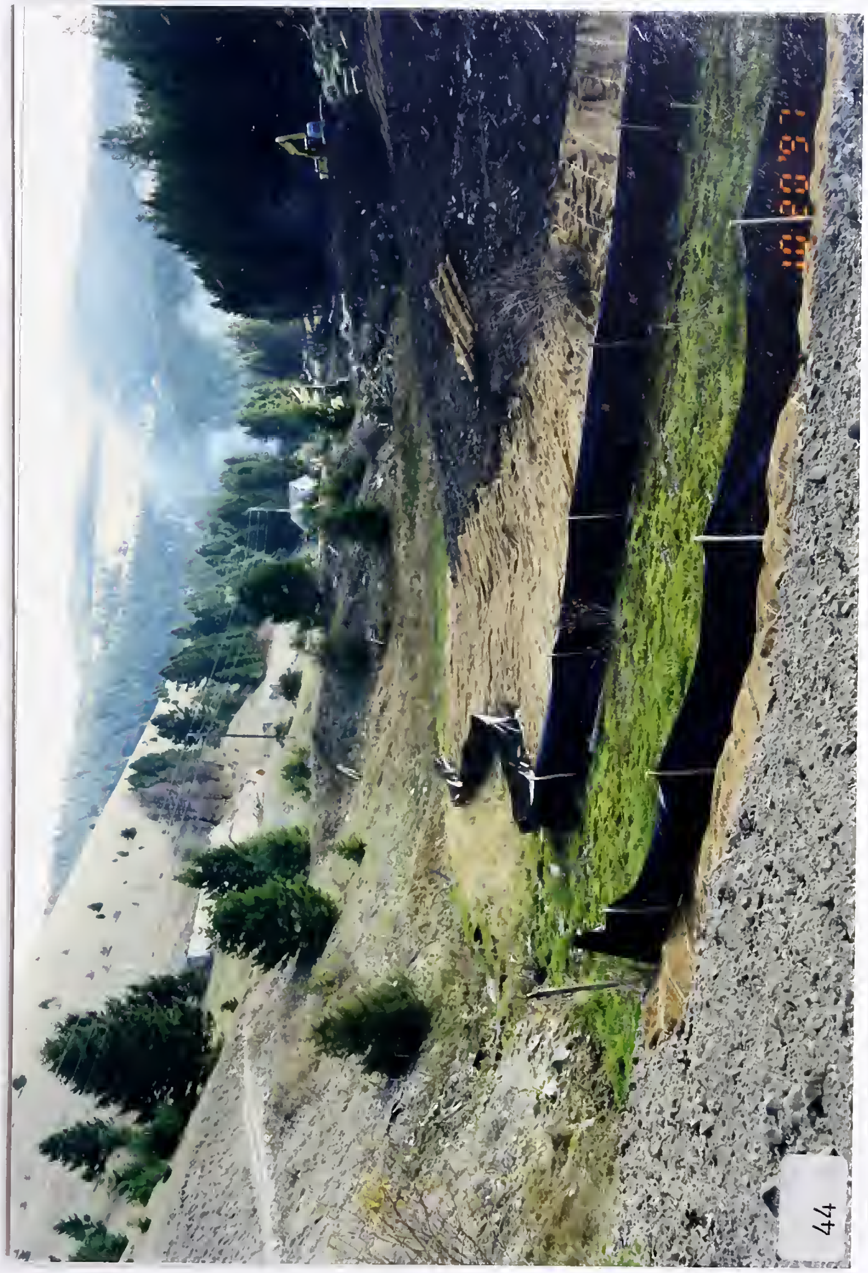

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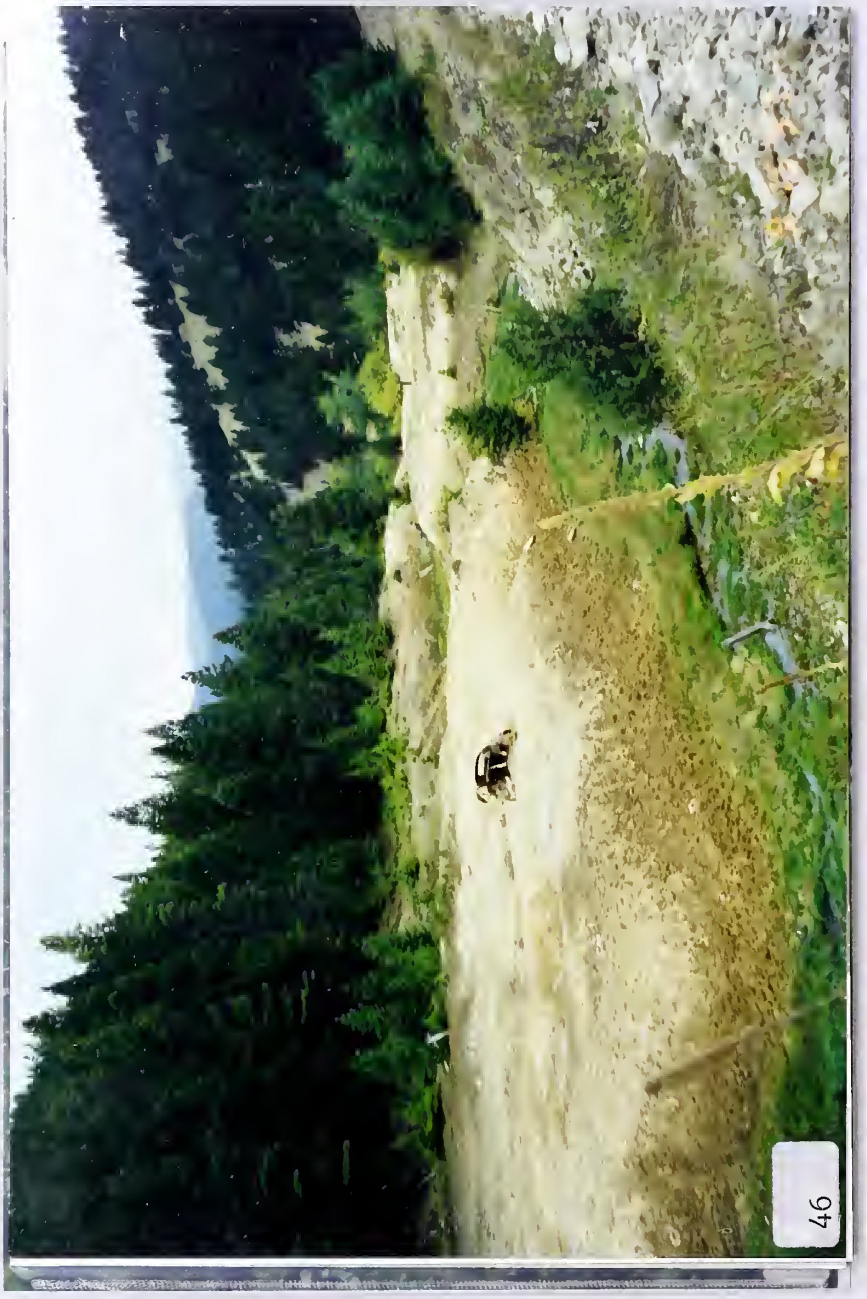

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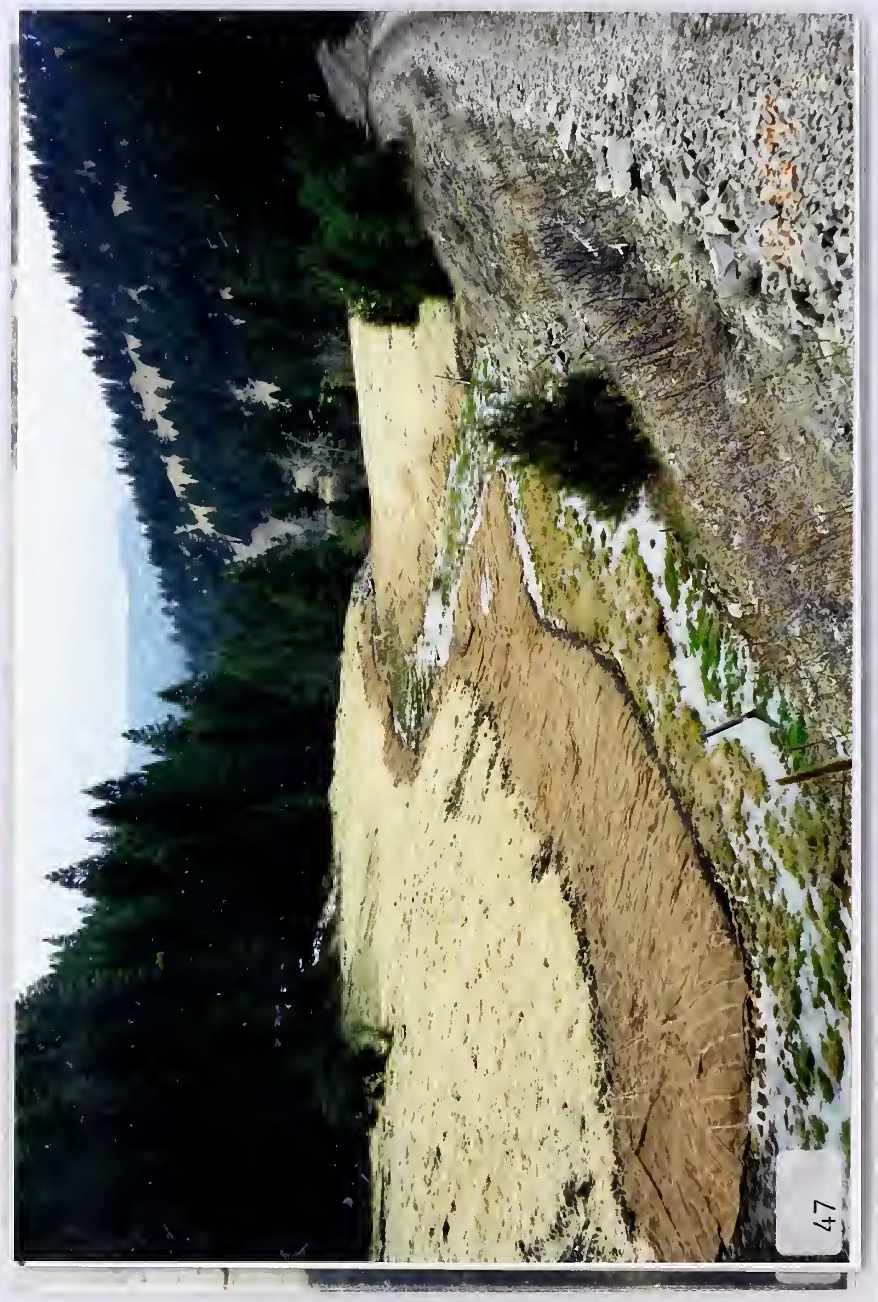

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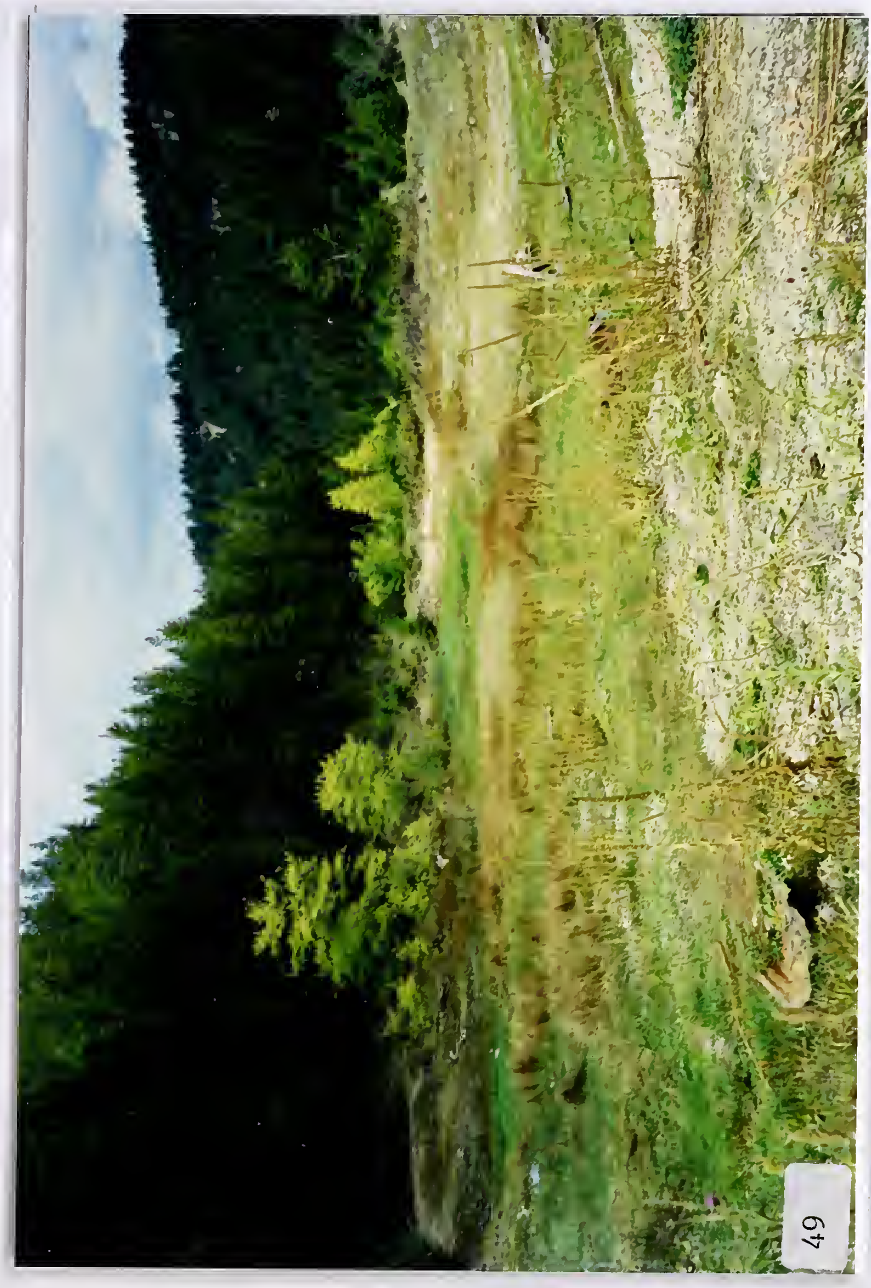

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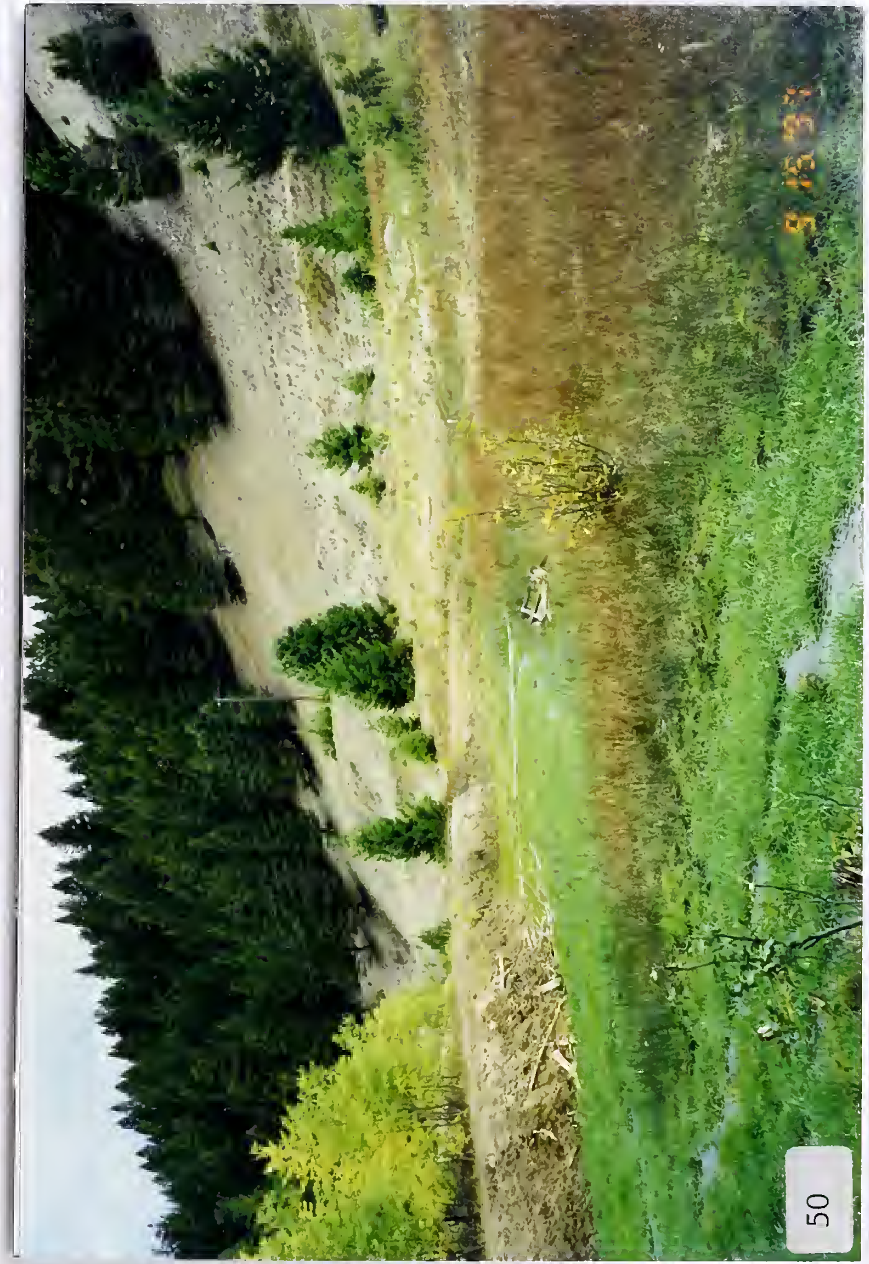

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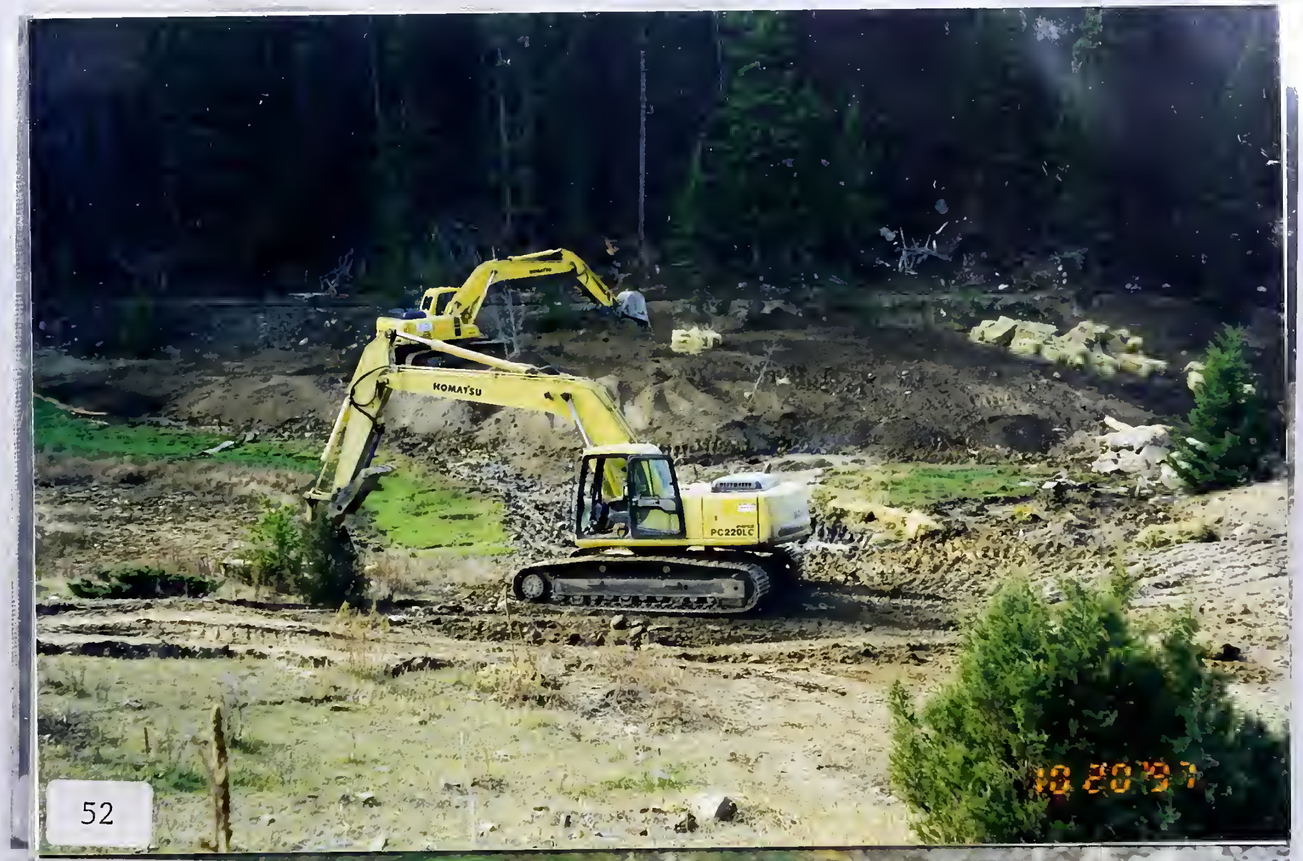
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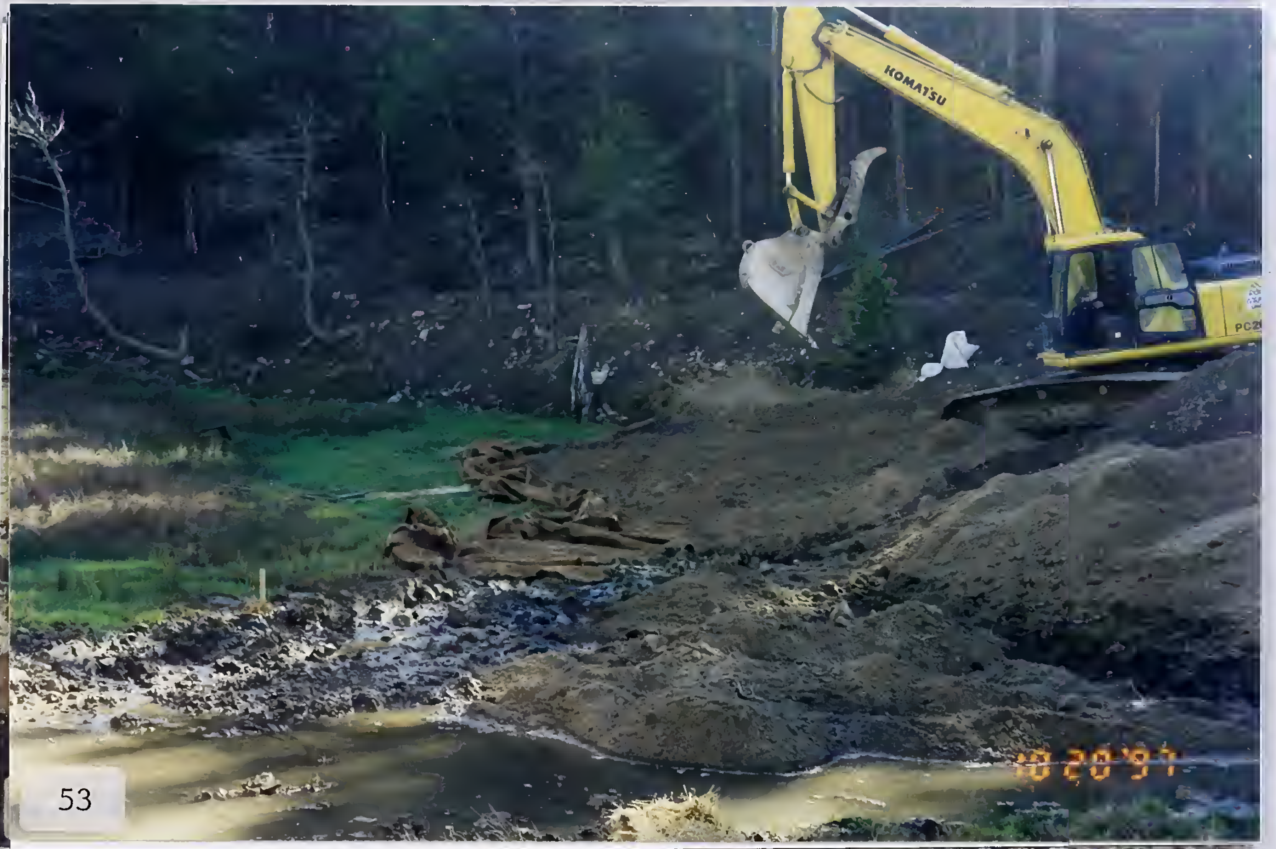
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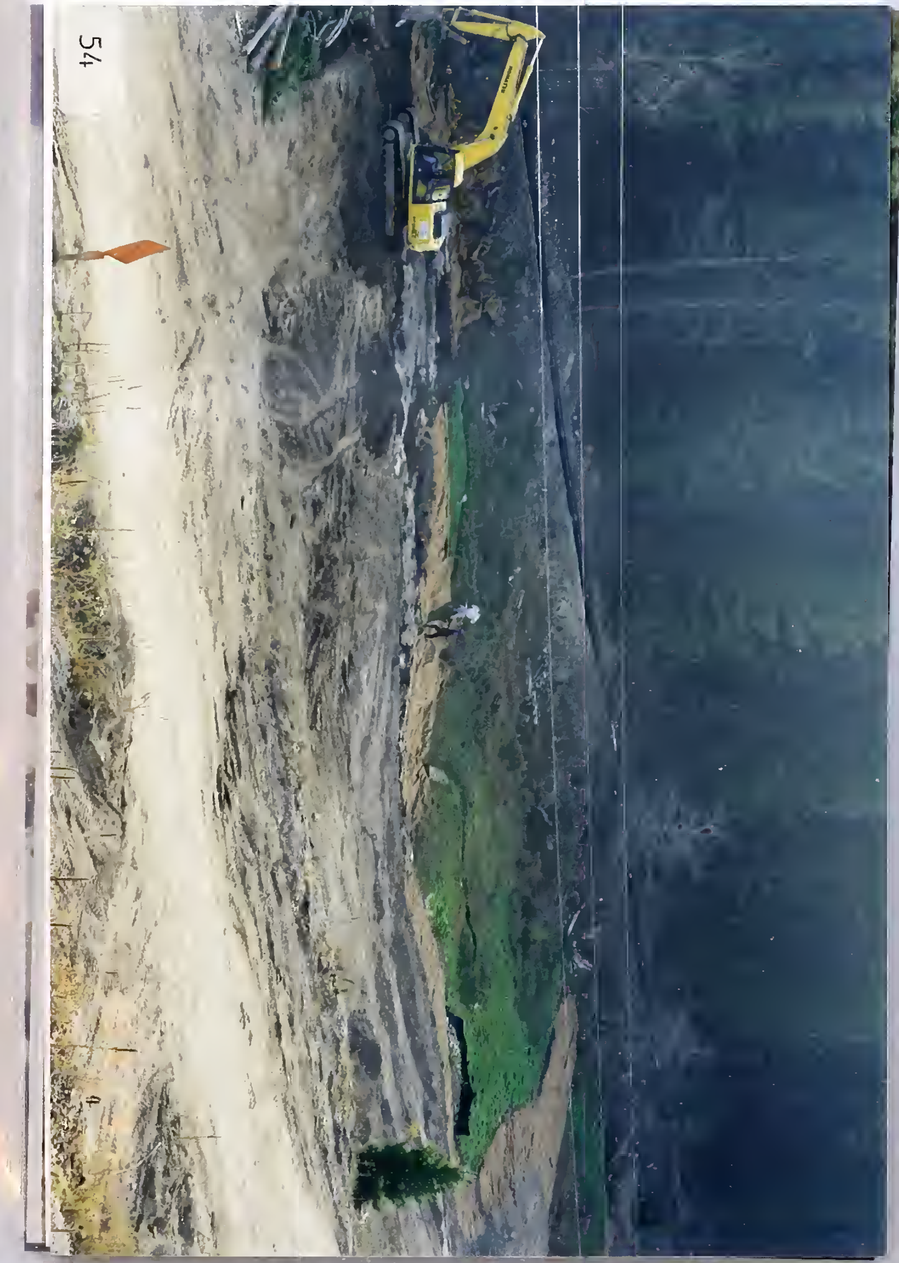
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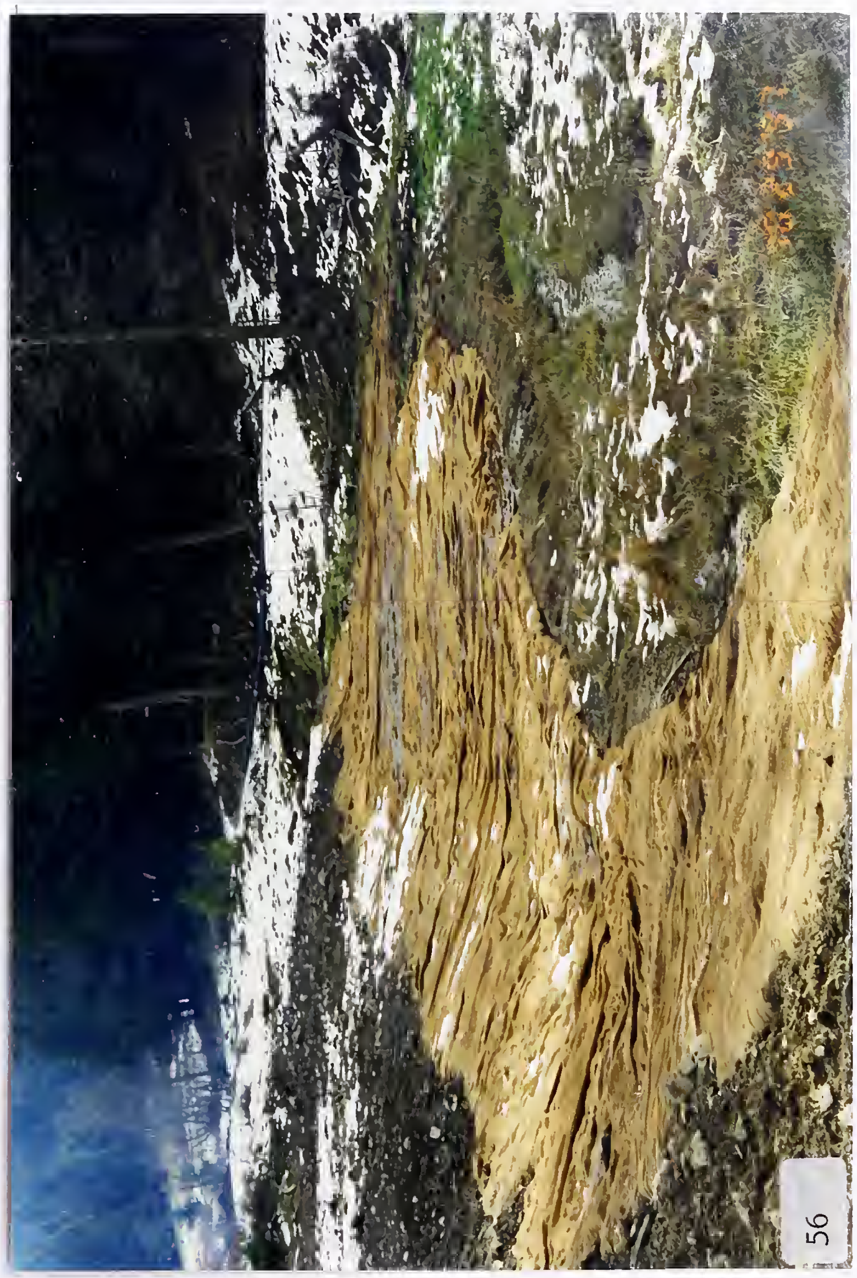

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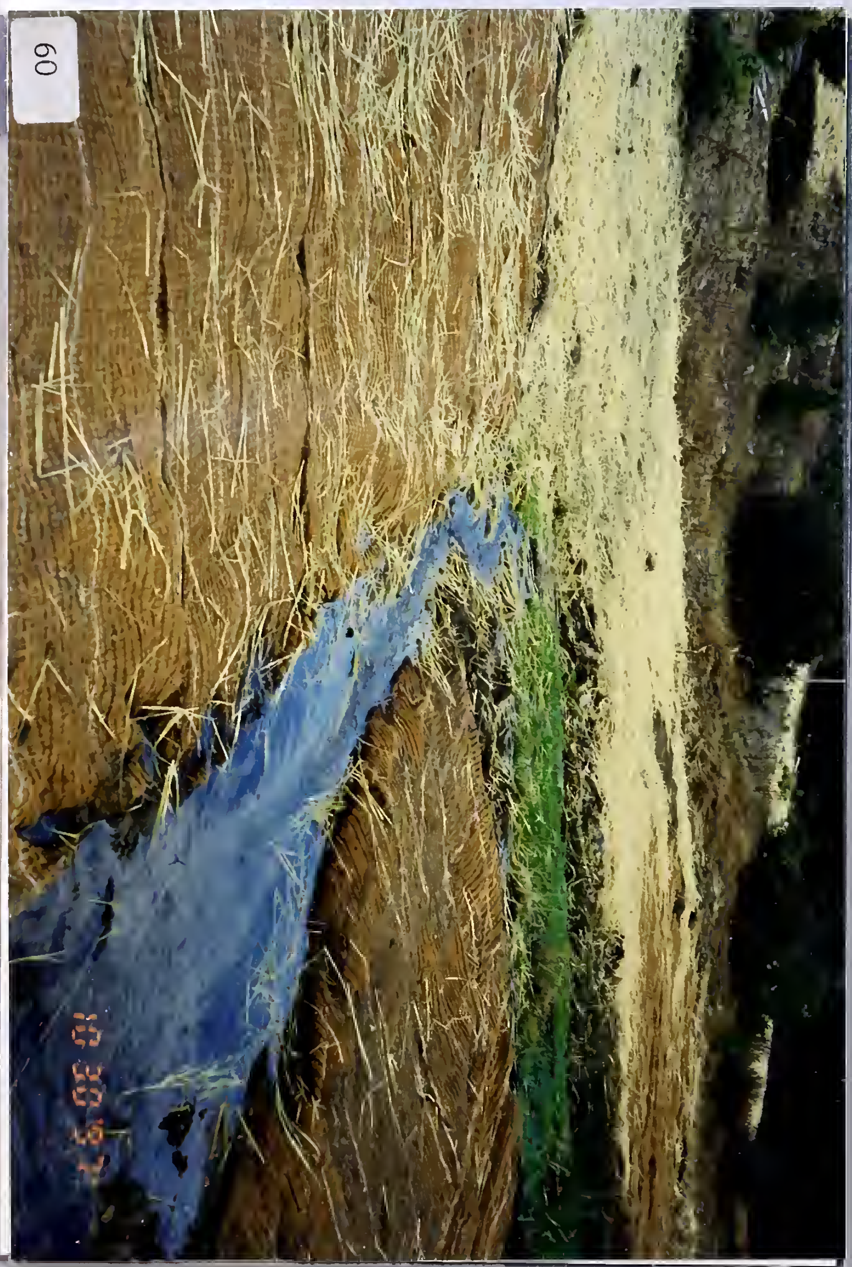
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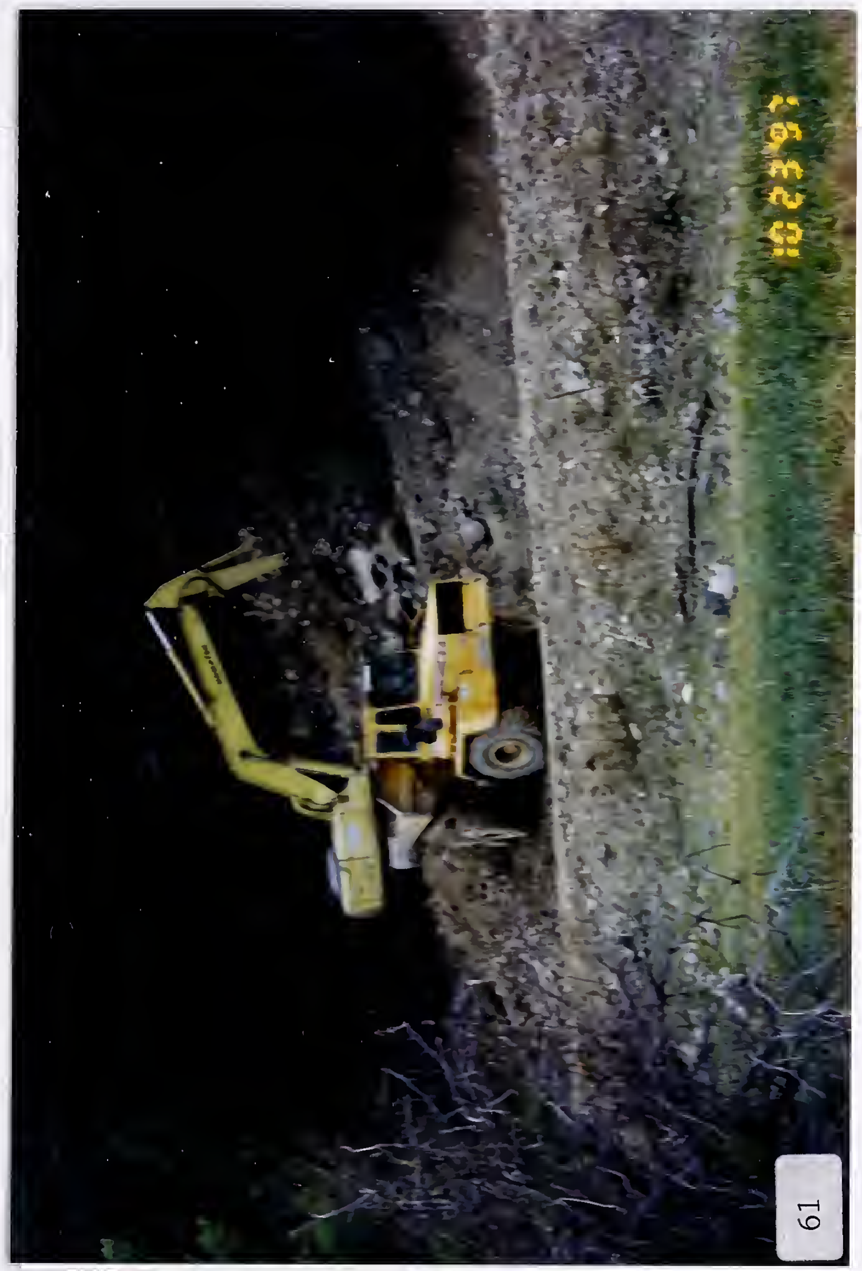
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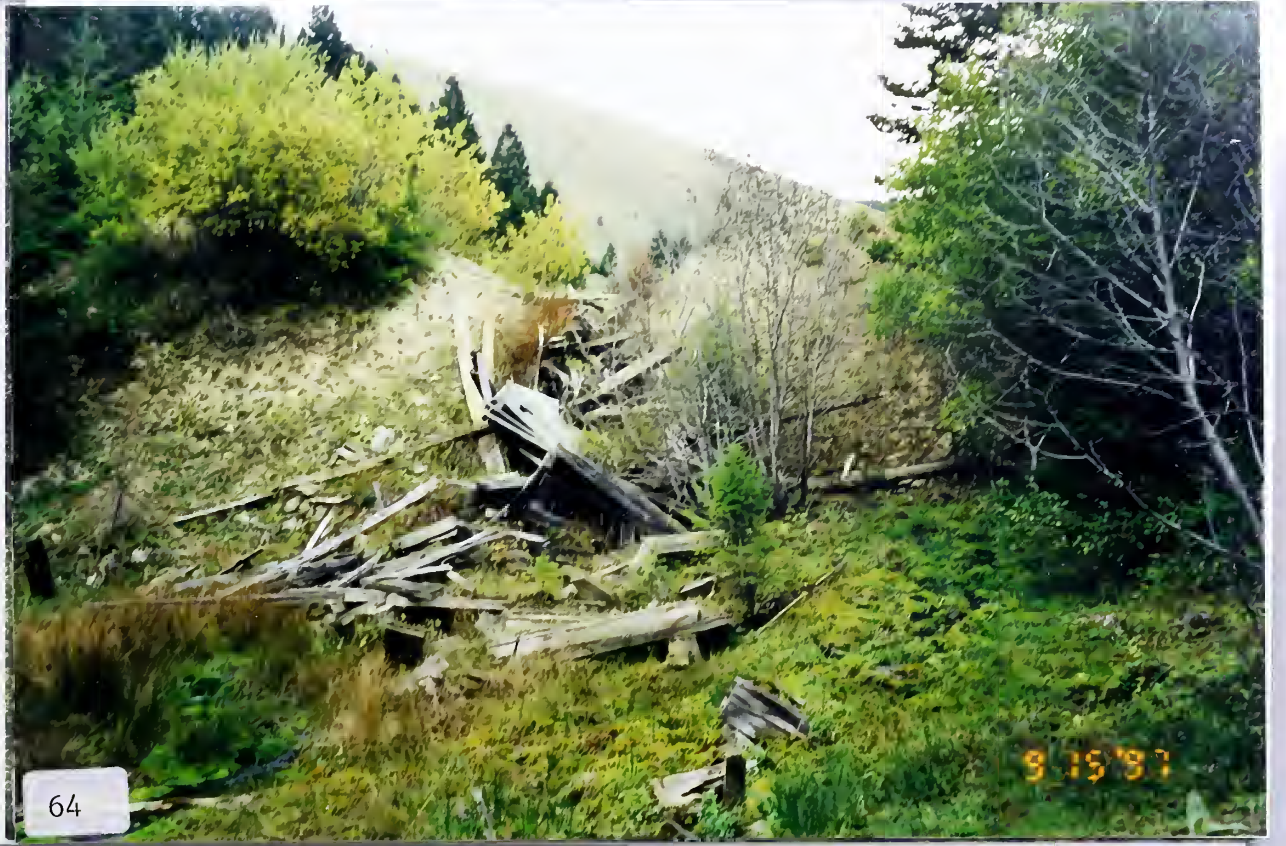
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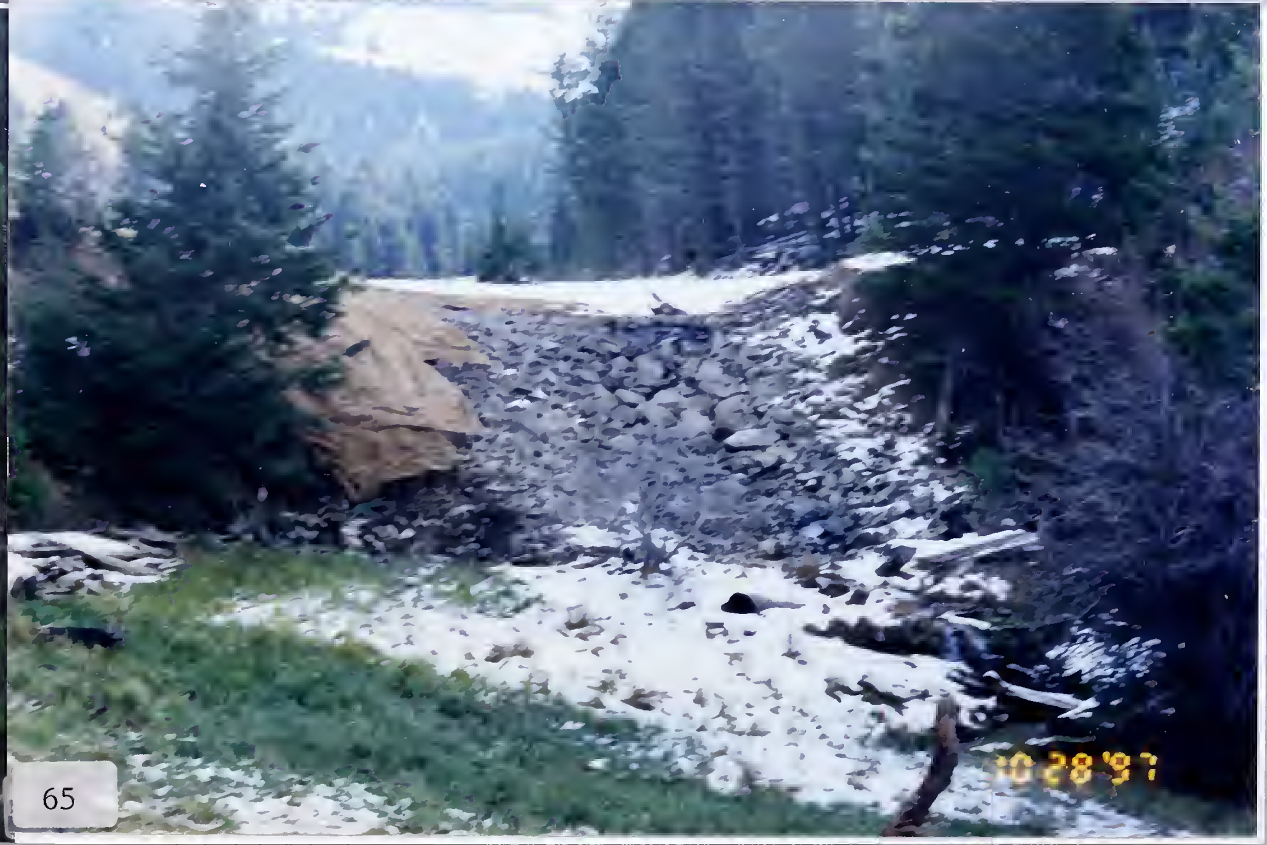
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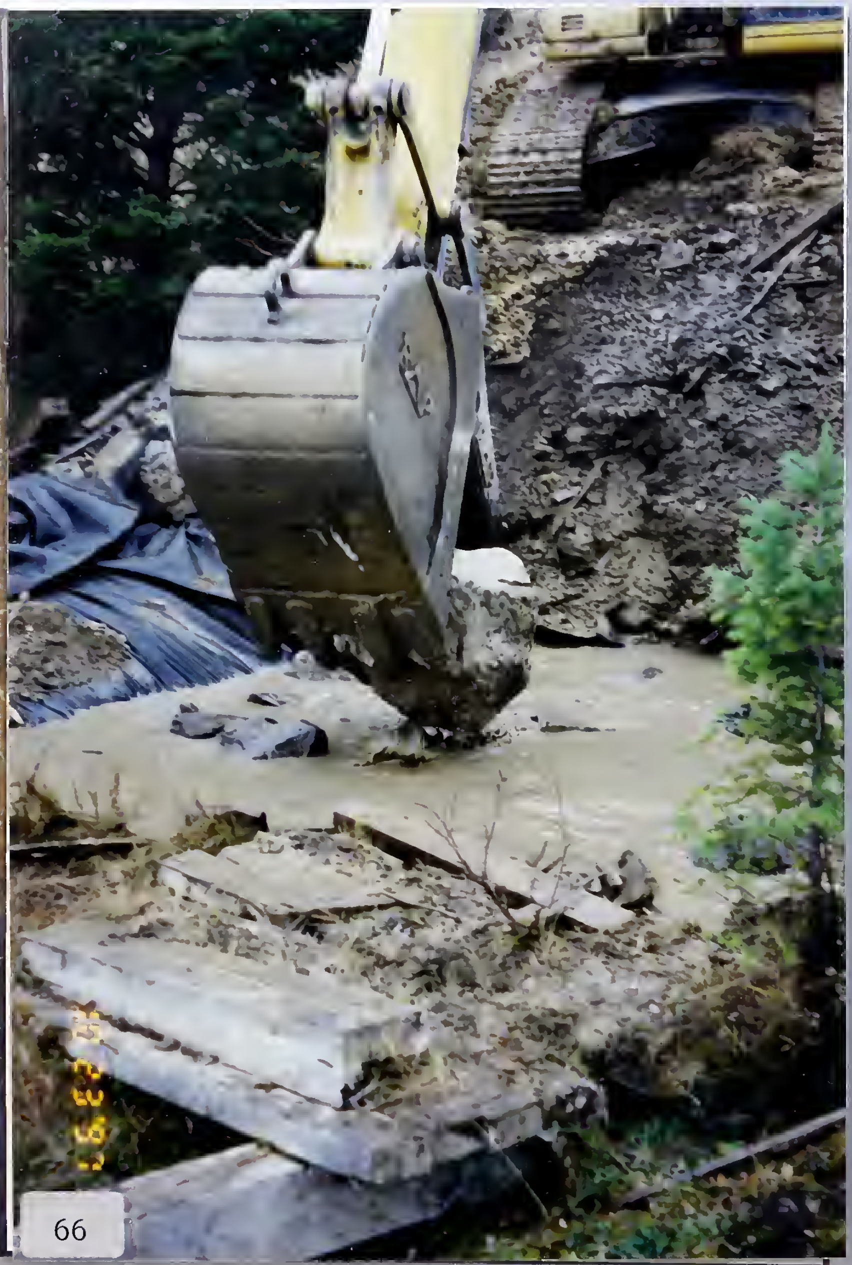
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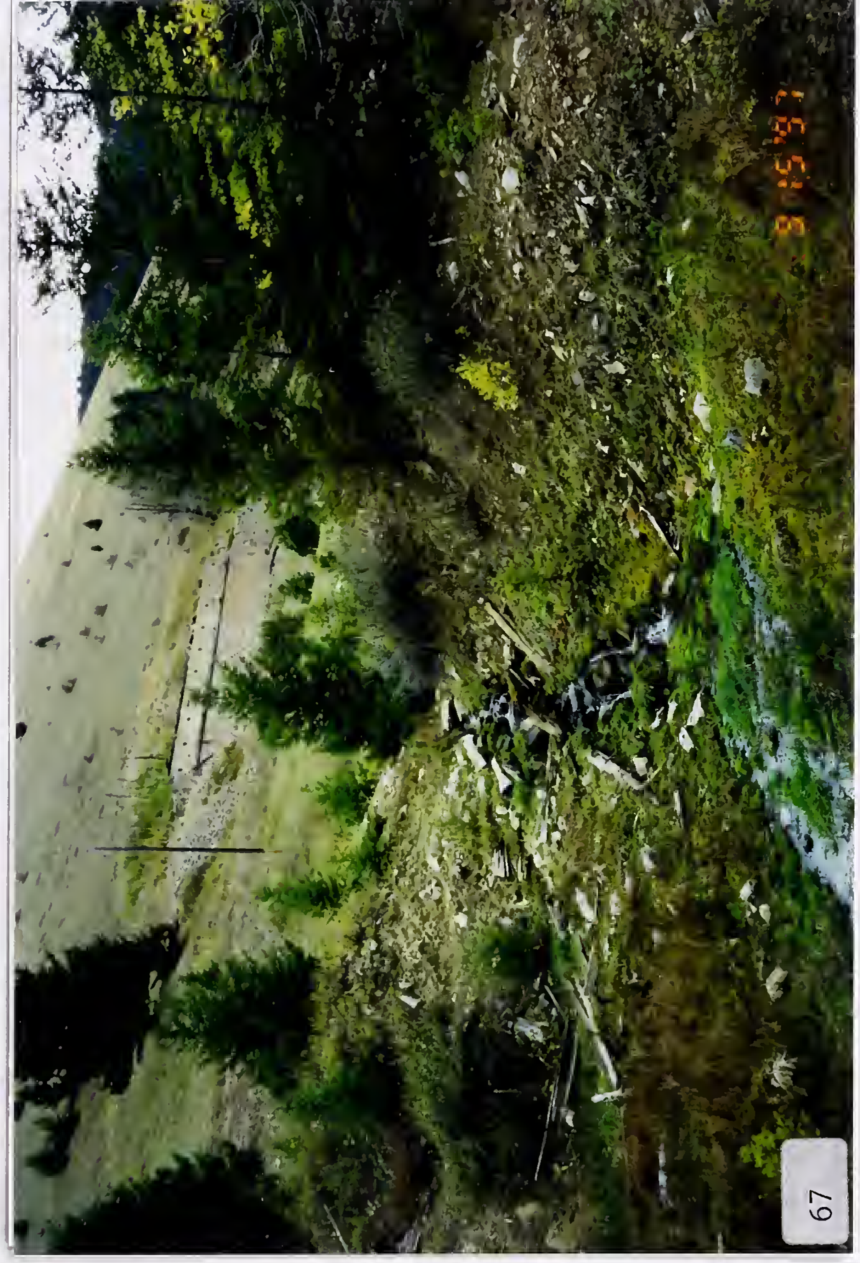

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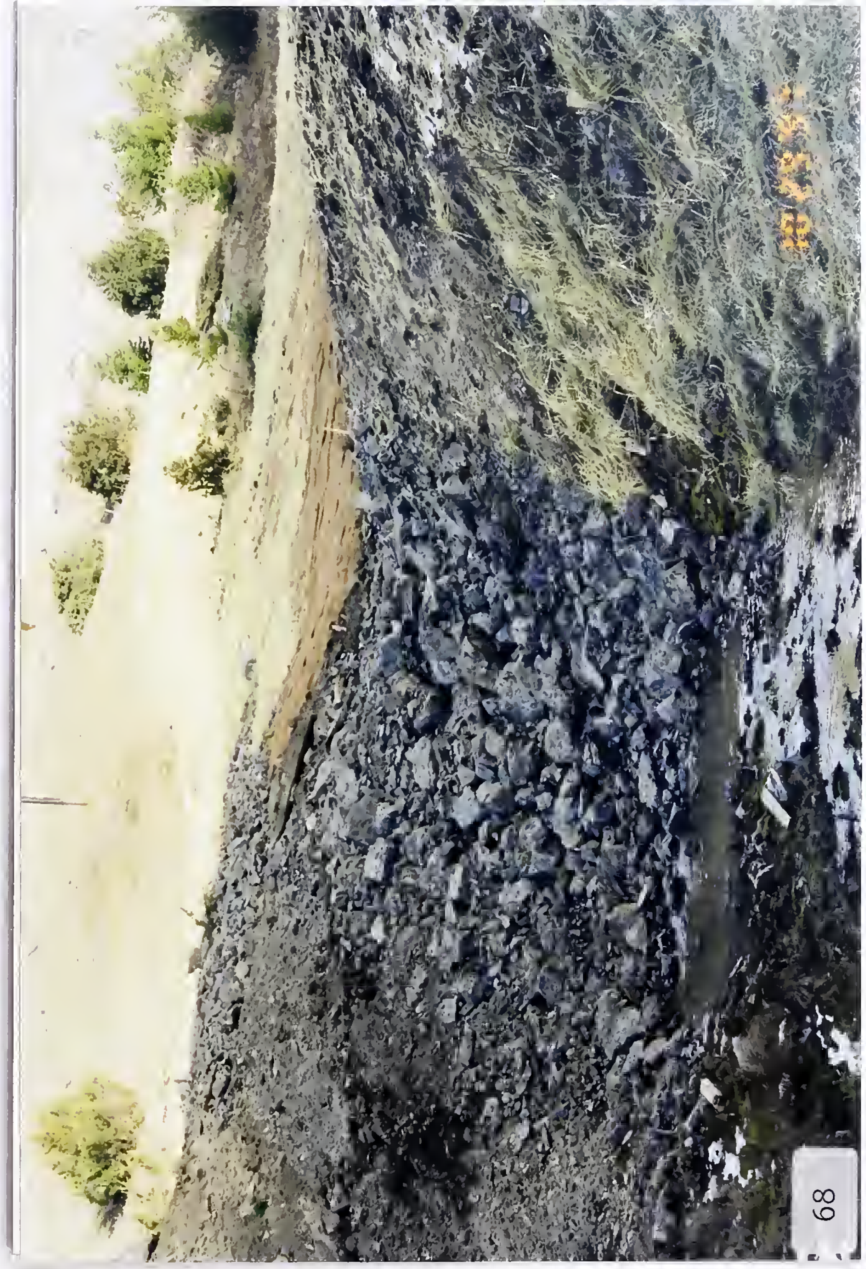

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